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## CAMERON.

CAMERON'S achievement stands alone. For the first time, in the history of the world, a European traveller has walked across tropical Africa from east to west. But Cameron has done more. This wonderful march of 3000 miles is but a portion of his work. He has taken such a series of scientific observations as will place him in the foremost rank of practical geographers; he has surveyed the southern half of the great Lake Tanganyika, has solved the problem of the course of the Congo, and has fixed the position of the water-parting between the Congo and the Zambesi.

Readers of the *Geographical Magazine* will have followed the career of the now famous traveller, step by step, from the date of his departure from England in December 1872. But it will be well, before giving a brief outline of the results of his march to the west coast, to cast a glance back at his previous labours; for, unless they are also remembered, the difficulties he has overcome, and the full value of the work he has done will not be appreciated.

Born in 1844, and having entered the Navy in August 1857, Lieutenant Cameron was only twenty-eight when he received his instructions from Sir Bartle Frere at Zanzibar, and took command of the Livingstone East Coast Expedition. His previous services, which qualified him for this important charge, are recorded at page 274 of *Ocean Highways* for December 1872. His instructions, dated February 14th, 1873, were to take up supplies to Dr. Livingstone, and to carry out such exploration as he might direct or advise, it being specially pointed out that the completion of the survey of Lake Tanganyika was work of great importance. Accompanied by his friend and old messmate Dr. Dillon, R.N., and by Lieutenant Murphy, R.A., Cameron made a final start from the east coast for the interior on the 18th of March 1873.

The young Lieutenant showed his admirable fitness for the work from the first. There were special and peculiar obstacles which entailed very heavy expenditure, and Dr. Kirk was of opinion that no expedition, starting from Zanzibar, ever had so many difficulties to encounter. These difficulties are enumerated at page 486 of *Ocean Highways* for March 1874. Cameron gallantly faced and overcame them, and, in spite of them all, he reached Unyanyembe on the 4th of August 1873.

At this place all the members of the expedition suffered terribly from illness. Out of forty-five days Cameron himself was down with fever during twenty-nine, and was afterwards prostrated by a still more serious fever of a remittent type and inflammation of the eyes. It was here that the faithful servants of Livingstone, bringing with them the remains of the great traveller and his journals and other effects, joined the relief expedition, and received that aid which enabled them to reach the coast. Lieutenant Cameron sent down the Livingstone caravan to the coast, in charge of Lieutenant Murphy, with ample supplies for the journey; and the continued illness of Dr. Dillon obliged him also to return. The party left Unyanyembe on the 9th of November 1873, and on the 17th, Cameron's friend, Dillon, "a skilful and zealous officer and a highly accomplished scholar, a firm and steadfast friend," succumbed to the effects of over-work and a pestiferous climate.

Cameron was now alone; but his work was not yet done. Livingstone's servants had reported that a most important map belonging to the Doctor had been left at Ujiji, without which the record of the great traveller's discoveries would be very incomplete. It seemed to the young explorer that its recovery was a sacred duty, and he also considered himself bound to do his utmost, with the means at his disposal, to further the cause of geographical discovery. With these objects, but still suffering acutely from the effects of fever and ophthalmia, Cameron set out from Unyanyembe for the west on the 11th of November 1873. He kept on steadily working "Westward Ho!" with dauntless perseverance, until he reached the shores of the Atlantic.

Travelling through a difficult and entirely new country, he discovered several of the southern tributaries of the Malagarazi and the interesting region they water, and on the 21st of February, 1874, he reached the shores of Lake Tanganyika.* On the 26th, Dr. Livingstone's map was handed over to him, which he despatched by a safe hand to Zanzibar. Thus the first part of his instructions was fully and completely executed. Too late to succour Livingstone while living, he had done all that remained for him to do. He had enabled the faithful servants to convey the body of their beloved master to the coast, by furnishing them with supplies, and he had himself pressed onward to Ujiji to secure the safety of such maps and other records of the veteran explorer as might be there. These great services were now performed.

* See the map of Cameron's route from Zanzibar to Ujiji, facing page 180 of the number of the *Geographical Magazine* for August 1874.

It remained to achieve discoveries himself. His instructions told him to explore Lake Tanganyika. To this duty the gallant sailor added the unprecedented task of marching thence to the Atlantic.

Cameron's first great geographical exploit after reaching Ujiji was the survey of Lake Tanganyika, which he ascertained to be 2754 feet above the level of the sea. He launched his boats in March 1874, closely examined and surveyed the whole southern half of the lake, discovered the great stream called Lukuga, flowing out of it, and returned to Ujiji on the 9th of May. His invaluable map of the lake will be found facing page 72 of the *Geographical Magazine*, for March 1875, and was also published in the *Proceedings of the Royal Geographical Society*. Cameron has since been informed that Lukuga, the outlet of Lake Tanganyika, falls into the Lualaba above the junction of the Luvwa and Kamorondo.

On the 19th of May 1874, Cameron sent off his last letters to Zanzibar, and set out from Ujiji on his great westward journey. In our number for March we shall give a carefully prepared map of Cameron's route across Africa, with critical notes by Mr. Ravenstein. Meanwhile the best map with which to follow his track, and obtain a correct idea of its relation to the routes of former travellers, is the Map of Tropical South Africa, by Mr. Ravenstein, illustrating the progress of geographical discovery, which faces page 1, in the number of the *Geographical Magazine* for January 1875. Here will be seen at one glance the routes of Livingstone, Ladislaus Magyar, Graça, and the Pombeiros—the only travellers who have approached the region discovered by Cameron.

The gallant explorer started from Ujiji on his lonely and chivalrous expedition on the 20th May 1874, and, after traversing the Manyuema country, arrived at Nyangwé on the Lualaba, the furthest point reached by Livingstone, in the following August. He found that Livingstone had placed this station 90 miles too far to the west. It proved to be only 1400 feet above the level of the sea, which at once puts an end to any notion of the Lualaba being connected with the Nile system. Instead of flowing north, the Lualaba here turns to the west, and then W.S.W., eventually entering and flowing through a great lake called Sankorra. The river receives many tributaries from the south, and one very large stream from north of the equator, called the Lowa. Thus the drainage both from north and south of the equator accounts for the two rises in the Congo. For Cameron has now fully established the identity of the Lualaba and Congo.

The advance from Nyangwé, Livingstone's furthest point, was the most momentous crisis in Cameron's undertaking. The difficulties were great. It was impossible to obtain canoes. The chief beyond the Lomamé, which here falls into the Lualaba, declared his resolution of making war if the explorer attempted to cross his country. He was thus diverted from his intended route down the course of the Congo. But he was not to be stopped. While avoiding collisions, and keeping on friendly terms with the natives, the young lieutenant could not be turned from his firm resolve to achieve his great object—to reach the Atlantic. The route he actually did take was of equal importance, and led to equally valuable geographical discoveries. It led south from Nyangwé, up the eastern side of the valley of the Lomamé, to Kilemba, the capital of a great chief named Kasongo, who ruled over all the country of Urua.

The Urua country was first made known to us by Captain Burton, in his *Lake Regions of Central Equatorial Africa*, who calls it Uruwwa, "a central district west of Tanganyika," with a ruler named Kiyombo, who was friendly with the Arabs, and traded in ivory, slaves, and copper from Katanga. Dr. Livingstone also heard of the same country, which he called Rua; but Cameron was the first to discover it, and fix its position.

Cameron remained at the capital of Urua from October 1874 to February 1875. It is a most important central point, for here the traders from the east and west meet. Cameron found an Arab merchant named Jumah ibn Salim from Zanzibar, and also two mulatto traders, named Alviz and Coimbra, from Bihé in Benguela. His long detention in Kasongo's country enabled the explorer to collect much valuable geographical information respecting the whole of this part of tropical Africa, including a complete and detailed account of the rivers and lakes which feed the Congo from the south. He discovered a new lake called Kassali, through which the Lualaba flows; and another, with no outlet, called Möhoya, which is specially interesting from having regular lake villages on its waters. He discovered also that the Lomamé is a distinct river from the Kassabé, receiving a large stream called Luwembi from the west, coming from a lake called Iki, probably the Lake Lincoln of Livingstone. Katanga, the famous copper-yielding district, within the territory of Urua, is situated between the rivers Lualaba and Lufira, which unite, and the combined stream, after flowing through a chain of small lakes, receives the Lualaba of Livingstone, which is really the Luvwa. The united rivers then flow through Lake Lanji (the Ulengè of Livingstone), and past Nyangwé to Lake Sankorra, and thence, as the Congo, to the sea. Cameron ascertained the names and positions of all the different tributaries of these rivers, and will be able to give a complete account of the hydrography of this newly-discovered region of the Upper Congo.

He speaks highly of the Arab traders, and especially of Jumah ibn Salim, whom he met at Kasongo's capital. He says—"Not content with feeding me when I was living with him, he kept on sending me rice and flour until we made our final start from Kasongo's, and now, over three months on the road, I am still eating his rice. All the respectable Arabs have been most kind and friendly, and are nearly all thorough gentlemen in their ideas and ways."

After many vexatious delays, Cameron, accompanied by the mulatto Alviz, set out from Kasongo's country for Benguela. His course led him past the sources of the Lomamé and the Luwembi, and, close to the sources of the Lulua, he came upon water flowing to the Zambesi. He travelled over a rich table-land, with numerous streams, to Sha-Kilembe's town, which he reached in September. The nights were cool on this elevated plateau, and on two occasions there was actually frost, when Cameron enjoyed the feeling of the crisp soil crunching under his feet. Sha-Kilembe is the Ya-Quilem of Ladislaus Magyar. It is on the river Lumèji, a tributary of the Liambeje, in latitude 11° 31′ S., and longitude 20° 24′ E. In the march from Urua to Sha-Kilembe, Cameron does not mention the

country of the Muata Yanvo, a great chief, whose capital was visited by Graça and the Pombeiros, and who was then said to be sovereign of all the region as far as Kazembe's. Kasongo, King of Urua, is the greatest chief on the route traversed by Cameron. The territory of Muata Yanvo is further west, in the region watered by the Kasabi and its tributaries, and its chief is probably not so powerful as in the days of Graça.

As the travel-worn party approached the goal all nearly spent, and with supplies at the lowest ebb, their leader performed an additional journey of 120 geographical miles, in order to bring assistance to his native followers. The route led from Sha-Kilembe to Bihé, and thence to the Portuguese town of Benguela on the shores of the Atlantic, where Cameron arrived last October, and whence he proceeded to Loanda to recruit his health. Thanks to the forethought of the Viscount Duprat, the great traveller received every attention and much kindness from the Portuguese officials. As soon as he has found means of sending his other followers to Zanzibar, he will return home with old Bombay, the veteran servant of former travellers, and a small boy, named Jacko, who accompanied him from Unyanyembe.

When Cameron arrives in this country, and fills in the details of the mere skeleton route which is now before us, we shall have a story of unsurpassed interest; whether we consider the great geographical discoveries he has made, the new regions he will describe, or the personal narrative of the intrepid sailor himself.

But Cameron's extraordinary merit rests mainly on the number and value of his scientific observations. The total distance over which he has marched from Zanzibar to Benguela is 2953 miles. Along this route he has fixed 85 positions, and taken 706 observations, consisting of 137 for latitude by stars north and south of the zenith, 196 for time, 368 lunar observations, 1 for the sun's eclipse of April 6th, 1875, and 4 amplitudes for compass variation. His method of observing lunars for longtitude is of the first order, namely, by stars east and west of the moon's enlightened limb; and by computing his observations, he has not only laid down his route accurately, but has also projected a remarkable section of the country over which he travelled, from the Indian Ocean to the Atlantic. The heights of places above the sea are determined by four Casella's aneroids, including 3718 observations, and by 70 observations of 5 boiling-point thermometers. The itinerary gives the approximate latitude and longitude of all the places visited, and their distances from each other; and by this itinerary, with the observations for height, the section sheets have been projected. Cameron also collected a vocabulary of the language of interior Africa, comprising 1400 words.

As a brave and resolute traveller the young lieutenant takes his place in the first rank of African explorers. As a scientific observer he stands alone, *facile princeps*. But not the least satisfactory feature in his great achievement is the absence of that truculent blood-shedding and slaughter of which we have lately heard so much. No bitter feeling will be left on the track of the gallant sailor who has crossed tropical Africa, and has come among people who never before set eyes upon a white man, as a genial friend, not as a destroyer. He has proved himself to be a worthy representative of his country, and the reputation of the noble profession to which he belongs has been safe in his hands.

The vast importance of Cameron's discoveries, which establish on a firm basis the geography of south tropical Africa, cannot be fully appreciated and understood without a carefully prepared map accompanied by a critical commentary; which will be published in our number for March. Meanwhile we may look for the return to this country of the great traveller himself, where he will receive a hearty and cordial welcome. There is but one sad thought to cast a shadow over his success. In one of his letters from Loanda he touchingly alludes to the untimely death of his poor friend Dillon, and says that his pleasure would be complete if his old messmate could also have been writing home at his side. Dillon nobly fell. Cameron has been spared to achieve a great success, for which he has earned the admiration of his countrymen, and by which he has added another name to the long and glorious roll of English discoverers.

But Cameron himself has abstained from laying any claim to theoretical or hypothetical discoveries, and has merely stated facts that have come under his observation, and the reports he has collected from Arabs and natives. He has never claimed the discovery of the outlet to Lake Tanganyika. He has simply described a stream, called the Lukuga, which he found to be flowing out of the lake, and the course of which he followed for 4 miles. He leaves deductions to geographers at home, while he furnishes them with accurate data for forming their conclusions. It is Burton who has generously called his young successor "the second discoverer of Tanganyika." Cameron's observations are more complete than those of any previous traveller, but he speaks, with characteristic modesty, of his discoveries. "As for geographical work," he says, "I have cleared up a lot of mistiness, if not positive darkness; but the work is immense, and ought to be taken in hand thoroughly and not by desultory expeditions which make their way to one point, and then have to come away with their work unfinished. Fresh men should take up the work of their predecessors, instead of, as at present, every man having to hunt for his own needle in his own bundle of hay." If all travellers worked and observed as Cameron has done, there would be little left to desire.

## INTRODUCTION OF THE CULTIVATION OF CAOUTCHOUC-YIELDING TREES INTO BRITISH INDIA.

As soon as a great demand arises for any vegetable product its cultivation becomes necessary, and this is one important cause of changes in the geographical distribution of plants. For no trees, growing wild in their forests, can long withstand the reckless and improvident attacks which will be made upon them as soon as it is discovered that the products are of great marketable value.

Yet the conversion of a class of plants from a wild to a cultivated state is a difficult undertaking, necessitating long and patient investigations, and the acquisition of a knowledge of the correct principles of

cultivation by continuous experiments. The most important, as well as the most successful undertaking of this nature has been the introduction of the cultivation of chinchona trees into British India.

The numerous uses to which India-rubber is now applied, renders a large and constant supply imperative, yet, until the last few years, the trees which yield caoutchouc have not been cultivated, but have remained exposed to the depredations of improvident collectors in their native forests.

Hence, as in the case of the chinchona trees, it became important that the trees yielding India-rubber should be systematically cultivated, in order that hereafter a large and regular supply of this valuable product may be secured. These trees either grow wild in the forests of Assam, or might be introduced, so that it was obviously a wise administrative measure to undertake their cultivation in British India.

The first step was to form plantations of the trees (*Ficus elastica*) which are indigenous in Assam; and the second to introduce those caoutchouc-yielding trees from other parts of the world, which might be found to yield a more valuable product than the Assam trees. The settlement of these questions made it desirable, in the first place, to institute an examination into the history of all the India-rubber yielding trees throughout the world; and, with this object in view, Mr. James Collins, then curator of the Museums of the Pharmaceutical Society, was, in 1871, entrusted with the duty of drawing up a report on the caoutchouc of commerce. This report contains information on the plants yielding it, their geographical distribution, climatic conditions, and remarks on their acclimatization in India. It was completed in August 1872, and was reviewed at page 67 of the *Geographical Review* for May 1873. Two maps will be found in the same number, one showing the geographical distribution of caoutchouc-yielding trees throughout the world, the other illustrating the area of forest in Assam in which the *Ficus elastica* is indigenous.

The deductions from the information collected by Mr. Collins were, that plantations should be formed of the *Ficus elastica* in Assam, so that this valuable tree might be brought under cultivation; and secondly, that the India-rubber trees of South America and Madagascar yielded a more valuable product than the *Ficus elastica*, and that consequently their cultivation should also be introduced into British India.

The necessary measures for securing both these objects were consequently adopted, and are now so far advanced as to call for special notice. We will first describe the progress of the cultivation of *Ficus elastica* in plantations in Assam, under the able superintendence of Mr. Gustav Mann.

The work was commenced in 1873. Hitherto the caoutchouc had been collected in the forests bordering on Assam, by wild tribes, and its collection entailed a reckless destruction of the trees. The first plantation in Assam extended over 28 acres (to be increased to 100), on the right bank of the Kulsi River, in the district of Kamrup. The second is at Charduar, 18 miles north of Tezpur, at the foot of the Himálaya, in the Darrang District, and covers 180 acres, to be increased to 400.

The *Ficus elastica*, like the banyan and other trees of the same genus, has aerial roots. It is also of an epiphytical habit, and, when wild in the forests, it often commences its growth in the fork of another tree, which it eventually overshadows and destroys. It, however, germinates on the ground with equal readiness, and even when growing from between the branches of another tree, it is only epiphytical in early life, after which it has its roots in the ground like any other tree. The *Ficus elastica* grows to a great size. There is one planted at Tezpur, now 32 years old, which is 110 feet high, diameter of crown 140 feet, circumference of the centre mass of aerial roots surrounding the stem 70 feet, and distance of the outermost aerial roots from the stem 30 feet. It has over 100 aerial roots, the largest of which measures 6 feet in girth 5 feet above the ground. A careful selection of sites for plantations is essential, for the great tree at Tezpur yields next to no India-rubber. None but the moist evergreen forests along the foot of the mountains in the Darrang, Naga Hill, and Lakhimpur Districts of Assam should be chosen for caoutchouc plantations.

The first experiments failed owing to the seedlings and cuttings having been placed under shade, the drip from the trees causing excessive wet about their roots. No artificial shade is now given; and at the Charduar plantation there were 16,401 live cuttings, at the Kulsi 1790, in the season of 1875. The young trees are healthy and vigorous. Experiments have been started to plant them in strongly made cane-baskets, placed in the forks of trees, a system which was first suggested by Dr. Schlich, the Conservator of Forests in Bengal. Experiments of planting *Ficus elastica* on a small scale, in grass land, are also carried on near Tezpur, by order of the Chief Commissioner of Assam. The conditions required for the healthy growth of the young trees are perfect drainage about the roots and looseness of soil so as to admit the air readily, plenty of light, heat, and moisture. The cost of the caoutchouc plantations for 1874-75 was 390*l*. In a year or two it will be possible to collect accurate information respecting the yield of India-rubber per tree. At present it is calculated that a full-grown tree, covering a quarter of an acre, with 30 to 40 stems and air roots, will yield about 10 lbs. of rubber a year, if regularly tapped. The most favourable time for tapping is from January to March, when the milk runs abundantly, but there is much room for improvement in the methods of collecting and manufacturing the caoutchouc. It will be the duty of the officers in charge of the plantations to investigate all these points, and experiments have already been started which will be carefully carried out and the results regularly reported.

There is another caoutchouc-yielding plant in the forests of British Burma. It is one of those creepers (*Chavannesia esculenta*) which it has hitherto been the object of foresters to extirpate in the teak forests, as injuring the growth of the trees. Some of these creepers, growing near Rangoon, have a girth of 11 inches round the stem, while the crown covers an area of 300 square feet, at a supposed age of five years. They can be propagated either from seeds or cuttings, and they yield rubber which has already been subjected to some preliminary tests. These tests indicate that its quality is similar to that of *Ficus elastica*. An interesting report on the *Chavannesia esculenta* by Mr. G. W. Strettell, of the Burma Forest Department, was

printed at Rangoon in 1874; and that officer has thus done valuable service in bringing to notice a new caoutchouc-yielding plant which promises to be of importance.

The second step connected with this measure is the introduction of such caoutchouc-yielding trees from other parts of the world, into British India, as are more valuable than *Ficus elastica* or *Chavannesia esculenta*. India-rubber trees are found within the tropics, in America, Africa, Australia, and the Malay Archipelago.

The most valuable of all is the *Hevea Braziliensis* from the valley of the Amazon, the India-rubber of which forms the chief trade of the port of Pará. Next comes the *Castilloa* of two species, abounding in parts of the Peruvian montaña and in the forests of Ecuador, New Granada, Central America, and Mexico. From Borneo comes an inferior kind of rubber from the *Urceola elastica*. Madagascar has a *Vahea*, a creeper yielding rubber of good quality; and in tropical Africa a very inferior kind is extracted from several species of *Landolphia*.

Of these kinds, the India-rubbers from the *Hevea Braziliensis*, the *Castilloas* of South America, and the *Vaheas* of Madagascar are superior to that from *Ficus elastica*. The cultivation of these trees should, therefore, be introduced into British India. The value of Pará rubber, from *Hevea Braziliensis*, is about 2*s*. 10*d*. per lb.; of rubber from the *Castilloa* trees, 2*s*.; and of that from the Indian *Ficus elastica*, 1*s*. 8*d*. No doubt the quality of all the kinds may be improved, and their value increased under careful cultivation.

Steps have been taken to obtain plants or seeds of the *Heveas*, *Vaheas*, and *Castilloas* for transmission to India. But the seeds are very perishable, especially those of the *Heveas* and *Castilloas*, and the difficulties have been considerable. Much cordial assistance has been given by Dr. Hooker, both in helping Mr. Collins in the preparation of his report, in procuring plants and seeds, and in raising them in the hot-houses at Kew.

Our knowledge of the *Hevea*, the most valuable of the India-rubber trees, is chiefly derived from the information furnished in Hooker's *Journal of Botany*,* by that eminent botanist and geographer, Mr. Richard Spruce. There is much also respecting the process of tapping the trees and manufacturing the rubber in Mr. H. A. Wickham's work, *Rough Notes of a Journey through the Wilderness from Trinidad to Pará*, 1872, which was reviewed by Mr. Wallace in our number of *Ocean Highways* for November 1872, p. 243. Some seeds of *Hevea Braziliensis* were obtained in 1874, and a small percentage was raised at Kew, the plants being sent out to Calcutta. So that there are already a few trees of *Hevea* in India. Mr. H. A. Wickham, who is now established near Santarem on the banks of the Amazon, and is a correspondent of Dr. Hooker, has undertaken to send periodical supplies of *Hevea* seeds until the object of introducing the cultivation of the tree into India is secured. A similar arrangement has been made with a Bolivian planter, established on the shores of the Purus.

Seeds of the *Vahea* creeper have been sent direct from Madagascar to India.

The measure adopted for procuring plants of the *Castilloa* has been completely successful. This genus, belonging to the natural order of *Artocarpaceæ*, was first described by the Spanish botanist, Don Vicente de Cervantes. He appropriately named it after Don Juan del Castillo, who went out to examine the vegetable productions of Mexico, and died in that country in 1793. The tree, the native name of which is *Ulé*, is one of the loftiest and most luxuriant that is met with in the forests of tropical America, and its caoutchouc is very largely exported to the United States, as well as to London and Liverpool. There are two known species, one the original *Castilloa elastica*, and the other, first described by Mr. Collins, and named by him *Castilloa Markhamiana*. As it is not known which of the two yields the most valuable product, or whether there is any difference between them, it is necessary that both kinds should be introduced into India. Dr. Hooker succeeded in obtaining plants of *C. elastica* from botanical gardens in Belgium. They were raised at Kew, and several were sent out to Calcutta in the autumn of 1875. In the meanwhile, it was determined to despatch an intelligent collector to the Isthmus of Panama, to obtain a good supply of the *ulé* trees from their native forests, and to observe their habit of growth, and the climatic conditions under which they flourish.

Mr. Robert Cross was selected for this important service. Originally recommended to Mr. Clements Markham, by Sir William Hooker in 1859, as one of his assistants in the collection of chinchona plants, Mr. Cross has since been employed on difficult botanical missions to South America, on four different occasions. In 1860 he assisted Mr. Spruce in collecting plants and seeds of the *C. succirubra* in the forests of Ecuador. In 1862 he again proceeded to Ecuador, and made an invaluable collection of *C. officinalis* in the forests round Loxa. He has since been twice employed to obtain plants and seeds of the chinchona species of New Granada, in which he succeeded after encountering most formidable difficulties. In conveying the plants, in a healthy state, from their almost inaccessible native forests to this country, he has invariably been successful. But he is not only an excellent gardener, and an intrepid traveller, he is also an intelligent observer. His reports contain indispensable information respecting the habitat of the plants; and he has added much to our knowledge of the geography and ethnology of the province of Popayan and the valley of the Cauca. No better man could have been found to execute the difficult commission of obtaining a supply of *Castilloa* trees, and conveying them from their native forests, in a healthy state, to the gardens at Kew.

Mr. Robert Cross left England on the 2nd of May 1875, and reached Panama on the 26th of the same month. He found that great destruction was going on among the *ulé* trees, in all parts of the Darien isthmus, as the native collectors cut down the trees in order to tap them more easily. After obtaining all the information that could be furnished at Panama, Mr. Cross determined to select the forests on the banks of the larger tributaries of the river Chagres as the base of his operations. He left Panama on the 9th of June, and proceeded to a place called Gatun, on the northern bank of the Chagres, whence he ascended the river, and then made a journey through the forests to the locality where the *Castilloa* trees are met with. He found the India-rubber saplings growing on the banks

* 1854 *et seq.*

of cool, clear streams, the roots often running down to the edge of the water. They abound also in deep, rich soil along the base of the hills, and are also met with on the summits of ridges; everywhere, indeed, except in swampy land.

Mr. Cross, after two long marches from the river, reached the hut of an *hulero* or India-rubber collector, on an eminence between the ridges of hills, where a small clearing had been made in the forest. He first very properly determined to collect seeds and send them to England. He accordingly selected a tree, waited until the seeds were fully matured, and then collected them on the 18th of July. The fruit has a short stalk which springs from the axils of the leaves. It is somewhat like the jargonelle pear, but is shorter, and has rough scales. The crown is flat, and when ripe assumes a beautiful scarlet colour, while the rest of the fruit remains green. The seed in size and appearance resembles a coffee bean, and is immersed in an orange coloured pulp. In proceeding down the Chagres with his collection of seeds, Mr. Cross's canoe was capsized by a sunken tree, and he with difficulty reached the shore. All obstacles being overcome, Mr. Cross despatched 7000 seeds from Panama on the 5th of August, but with little expectation that they would succeed, as oily seeds soon lose their germinating power. It was, however, desirable that the trial should be made.

Mr. Cross then returned to the forests, and proceeded to form his collection of plants. He obtained 600 plants, and also secured a quantity of the milk in order to prepare a specimen of the India-rubber. The sample was brought home, and has been examined and reported upon. It is pronounced to have much less impurity in it than is usual for this kind of rubber, which makes it comparatively more valuable, and thus proves that Mr. Cross's plants are of the best species. Dr. Hooker, judging from the leaf and general appearance, considers them to be of the *Castilloa Markhamiana*. The plants are young saplings, and were packed in three boxes, with dry leaves; a process which facilitated transport, but demanded an extraordinary amount of attention.

The *Castilloa Markhamiana* is generally from 160 to 180 feet high, with a diameter of 5 feet, and a yield of 100 lbs. of India-rubber. The wood is spongy and soft, and decays rapidly when bruised or injured. Many of the leaves measure 14 inches in length, and 7 inches in breadth. The milk-like juice is obtained by cutting out a groove of bark round the base of the trunk. The milk exudes into the channel thus formed, and large leaves are placed to receive it as it trickles down. The tree is then felled, and rings are cut round the prostrate trunk, about a foot apart. The milk is received in vessels, which are afterwards placed in a hole dug in the ground, where the contents are left to curdle for about two weeks. In Nicaragua, and in parts of South America, where caoutchouc is collected from the *Castilloa*, the trees are not generally felled.

The temperature of the forests in which the *Castilloas* flourish ranges from 75° to 88° Fahr., and though the isthmus forests are excessively damp, the range of the tree is so wide that, in some places, it must flourish in climates which at one time of the year are dry. It is probable, however, that the species yielding the best and largest amount of caoutchouc flourish best in a hot and very damp atmosphere. The *Castilloas* will no doubt do well in plantations with the *Ficus elastica*.

On the 6th of September 1875, Mr. Cross embarked at Colon, with his cases of plants, on board the mail-steamer 'Shannon'; and in the morning of the 8th, when going thirteen knots an hour, the vessel ran on the Pedro reef of rocks, off the coast of Jamaica, and about 80 miles from Kingston. Her bows were immoveably fixed on the rocks, while the stern continued to bump heavily for many hours. Mr. Cross stuck by his plants to the last, and was eventually taken on board H.M.S. 'Dryad.' He came home in the mail-steamer 'Nile,' reaching Southampton on the 2nd of October. About half the plants originally collected arrived safely at Kew, which, considering the extraordinary difficulties of the undertaking, is very satisfactory, and reflects great credit on Mr. Cross, who has thus, for the fifth time, performed an important public service with ability and success. His interesting and valuable report contains much indispensable information respecting the growth and habitat of the trees. There are now 134 of Cross's plants doing well in Kew Gardens, and in the course of 1876 a good supply of *Castilloa* plants, from the Panama isthmus, will be forwarded to India.

Thus the important measure of introducing the cultivation of the best caoutchouc-yielding trees into India has been fully inaugurated, with every prospect of successful results. On the one hand regular plantations have been established in Assam, and are progressing satisfactorily under the able superintendence of Mr. Gustav Mann; on the other the more valuable kinds from South America are being introduced into British India. There could be no doubt, owing to the great demand for caoutchouc for an endless number of purposes, that the adoption of this measure was urgently necessary. There can now be no doubt that it will be a success, and that a valuable product will be permanently added to the resources of our Indian Empire.

## ON FORMER PHYSICAL ASPECTS OF THE CASPIAN.

*(Continued from page 11 of our last number.)*

THE indications which have been submitted in the previous part of this paper, of the low level anciently possessed by the Caspian Sea, might not perhaps be considered of very great practical significance if some evidence did not also exist of a former flow of at least a portion of the Volga waters into the *Palus Mœotis*. The effect on the physical aspects of the Caspian basin, of such a diversion of its great tributary river, has been already described; and it remains to adduce the grounds from which it may be established, that the Volga actually possessed such a course in remote times. But before doing this, a few words may be said regarding the size of the two lakes, which the Caspian would have contained, under the conditions of desiccation being considered.

A fall of the Caspian surface to a depth of 1200 feet below the ocean level, would have laid bare a strip across the bed of this basin, between the 40th and 41st parallels of latitude; and a lake would have been situated on each side of this band. That to the

north of the band would have been the smaller, and possessed of an area of about 15,000 square miles; while that to the south would have covered the larger area of about 20,000 square miles. Now of the 14,000 cubic yards of water, received every second by the Caspian, to allow of its level remaining constant at a depth of about 84 feet below the ocean level, the Volga, as we have already seen, delivers about 10,000. It results, therefore, that 4000 cubic yards per second only are contributed by the remaining streams and by the rainfall of the basin itself; and the quantity is comparatively so small that we may, without any great error, suppose it to be equally divided, between the two portions of the basin. Such supplies would have about just provided for the evaporation from the surface of the southern lake, and rather more than have provided for that of the northern one. But we know that the aspects of the Caspian must anciently have been such, as to impress the old geographers and historians with the idea that this sea covered a much larger area than those of the two separate lakes, which were in appearance at least connected with one another. These conditions would have been met by the two open lakes having been joined and skirted by extensive marshes; and there are sufficient grounds for thinking that these actually existed in the Caspian basin. For the northern portion would have received that overflow from the north-western corner of the upper basin of the Aral which caused European geographers, down to tolerably recent times, to be unacquainted with the actual isolation of the two seas. The same portion of the Caspian would also have received some water from the lower affluents of the Volga; and, as will be presently seen, the Manytch would have acted as an escape channel for the waters of the *Palus Mœotis*, which formerly were possessed of a higher level than that of to-day. To the southern lake of the Caspian basin, in addition to the water escaping over the head of the Abougir Gulf of Lake Aral, there must be assigned a contribution from the Oxus, a stream which was said by Aristobulus (Strabo, b. xi. c. 7) to be the greatest river of Asia, those of India excepted. And allowing, therefore, that this river then contributed to the Caspian basin something in excess of the stream of the Tigris at Baghdad at the present day, the Oxus discharge into the Caspian may have been as much as 2000 cubic yards per second. All such supplies of water on their way down to the two small open lakes to which the Caspian had shrunk, would have fed those extensive marshes which the previous part of this paper shows to have edged that ancient sea, and which caused it to be described as composed of the three separate portions—the Hyrcanian, the Caspian, and the Scythic Gulfs; to which last Lake Aral doubtless answers. It consequently results that the diversion of the great portion of the Volga water into the *Palus Mœotis* is consistent with the physical aspects of the Caspian basin which have been handed down to us by early writers, such as Pliny, Strabo and Mela.

To proceed, however, with the consideration of the former probable course of the Volga. "When one crosses the Tanais," says Herodotus (b. iv. c. 21) "one is no longer in Scythia;" and though the historian of Halicarnassus is not clear that the river is the actual boundary between Asia and Europe (b. iv. c. 45), he certainly makes it the limit of the European Scyths, who wandered in the plains eastwards from the Ister. The Tanais of Herodotus had its source in a large lake, and emptied into the still larger one of the *Palus Mœotis*. All the best modern authorities say the Don, which takes its rise in the Ivan Ozero, lat. 54° 20′ long. 38° 3′ is undoubtedly the ancient Tanais. But the comparatively recent opening of the Bosphorus would still have left, in the time of Herodotus, many undrained lakes, scattered over the low steppes of Southern Russia, and the waters of some of these would have supplied the Tanais. Such circumstances would therefore render any present identification of the ancient sources of this river a very difficult matter. *En passant* we may note that the description of the *Palus Mœotis* as a great lake is some indication of the large size of its water-spread as compared with the dimensions of the outlet by the Cimmerian Bosphorus, into the *Pontus Euxinus*.

Waiving for the present the point regarding its sources, we will proceed to the evidence regarding the course of the Tanais, whose outlet Polybius also, among many others, places in the *Palus Mœotis*. "To pass from Europe into Asia," says Strabo (b. xi. c. 1), "one has only to cross the Tanais, which is the common limit of the two countries." In (b. xi. c. 1) the same authority says the Tanais comes "from the north," and a century later, Pomponius Mela (b. ii. c. 1) says the same thing, and adds that the river empties into the *Mœotis*, after descending from the Riphœan Mountains (Ural range). Arrian, in his Periplus, makes the Tanais the boundary between Asia and Europe, and also puts its mouth in the *Mœotis*. In the passage of Strabo last mentioned, it is stated "We know scarcely more of the Tanais, than its mouths, of which there are two, as everybody knows, emptying themselves into the *Mœotis*, at 60 *stadia* from each other." The geographer then goes on to say that the inhospitable nature of the country and the plundering proclivities of the inhabitants, prevent the river being ascended to any distance; but he very significantly indicates its sources as being situated towards the north. The Tanais was undoubtedly therefore regarded by all ancient historians and geographers as being the limit between Europe and Asia, and as falling into the *Palus Mœotis* after descending from the north. According to Pomponius Mela, one of the later of the authorities mentioned, we find it had its sources in the Riphœan Mountains, where the Kama takes its rise; and the passage of this river to a former outlet in the sea of Azof is therefore very strongly suggested.

At the present time the Kama waters pass by the Volga Channel, which contributes 10,000 cubic yards per second to the Caspian basin; while the Don carries but an eighth of that quantity, or about 1300 cubic yards per second to the sea of Azof. Third-class passengers are constantly carried without payment on the steamboats navigating the lower courses of the Don, on condition of assisting the vessels off the sand-banks, upon which they are continually running aground. On the other hand, the Volga, notwithstanding the neglected state of its conservancy, is navigated by large steamers to at least 2000 miles from its mouth. And it is therefore hard of belief that the course of the smaller of two rivers in such close vicinity, and of which the greater now forms a striking natural feature, from the volume of its stream, could have been

deliberately adopted by ancient geographers, as the appropriate limiting line between two quarters of the world. And if such an argument possess weight, the inference can only be that the channel of the Don (whose name, signifying *flood*, must have indicated its former size) would probably in ancient times have carried the greater portion of that discharge of water, which the Volga pours at the present day, into the Caspian basin.

Northwards, from latitude 46°, there extends along the right bank of the Volga an almost continuous ridge, which varies in height from 220 to 1000 feet above the ocean level. At Simbersk, however, there is in this ridge a gap by which the Volga stream might formerly have found its way into the sea of Azof, through the marshy valley of the Choper, which is an affluent of the Don. Some Russian geographers are inclined to believe, I have been told, in a former passage of the Volga waters, through this gap at Simbersk. Now in Herodotus (b. iv. c. 11) is a passage which describes how the nomad Scythians, who formerly inhabited Asia, warred unsuccessfully there with the Massagetæ, and quitted their ancient homes to take possession of Cimmeria, which they entered after crossing the river Araxe. This Araxe is considered generally to be the actual Volga, and from it, we learn in Aristotle (Meteorol., b. i. c. 13), as well as in the Periplus ascribed to Scylax of Caryanda, that the Tanais branched off to empty itself with the *Mœotis;* a condition of things which is also indicated by a fragment of Artemedorus, and which answers very precisely to the one now under discussion.

If such a flow of the Volga ever formerly took place to the *Mœotis*, it would have occurred at an epoch when the aspects of this body of water were different to what they now are. The surface of the Sea of Azof, whose surplus waters drain off by the Straits of Kertch, is still slightly higher than that of the Black Sea; and for centuries subsequent to the rupture of the Thracian Bosphorus, it is quite comprehensible that the Cimmerian Bosphorus had smaller dimensions, and that these latter straits have attained their present size by the action of water continuously flowing through them. Under such conditions the *Palus Mœotis* would have preserved its surface upon a higher level, and this surface may have remained constant owing to the former large contribution of the waters of the Araxe, which passed by the channel of the Tanais. If we suppose that the greater part of the present Volga waters formerly flowed by the Tanais into the *Mœotis*, this sheet of water might have had an additional area of 80,000 or 90,000 square miles.

That such were actually the former aspects of the *Palus Mœotis*, there are ample records to show, and a quantity of evidence to this effect will be found collected in Dureau de Lamalle's *Géographie Physique de la Mer Noire*. According to Herodotus, the *Mœotis* was scarcely inferior in size to the Pontus itself, and was called by the Scyths Temerinda, or the "Mother of the Pontus." The decrease in the size of the *Mœotis* can be followed from the map of Ptolemy down to more recent historical times, and such a decrease could have been caused by a gradual enlargement of the Straits of Kertch, and eventually by a transfer of the Volga waters into their present course. At what date such a transfer took place may probably some day be ascertained. At present we know only that in the 10th century the Don is stated by Constantine Porphyrogenitus *(De Administra. Imp.)* to have its sources in Russia, near the town of Sarcel. At this date, therefore, the Don and the Volga must have flowed separately. The story cited by Stritter from the historians of Byzantium, and which informs us that the Scyths on their incursions into Persia, had to pass a marsh before crossing the range of the Caucasus into Media, shows that an overflow from the *Mœotis*, by the channel of the Manytch into the Caspian basin, was either taking place or had just ceased, in the 5th century of the Christian era. Such a junction of the two basins was anciently recorded by Aristotle, and was mentioned by Plutarch in his life of Alexander, and is possible only in the event of the *Mœotis* having possessed a surface elevated at least 24 feet above the present level of the Sea of Azof. We have then a strong indication that in the 5th century this sheet of water actually possessed such a level; and that the Volga waters at that date could not have yet deserted their ancient outlet, to flow into the Caspian basin as they do at present.

The quantity of water which might pass out of the Black Sea, through the narrowest part of the Bosphorus, between Roumeli Hissar and Anadoli Hissar, has been estimated to be about 34,000 cubic yards per second, were the whole of the cross section of the strait occupied by an issuing stream. On the other hand, M. Elisée Reclus calculates *(Le Globe de Genève*, tome xiv.) that the total volume of the tributary rivers, added to the rainfall flowing out of the Black Sea basin, does not actually amount to 26,000 cubic yards per second. The difference between the two quantities specified appears to support the theory that the Bosphorus, like the Strait of Gibraltar, is a passage occupied by counter currents, and is not a river channel serving merely to convey the surplus waters of the Black Sea to the Mediterranean.

The question is, however, whether such may not actually have been the case in ancient times, and whether the superfluous size which the Bosphorus now possesses may not have been due to the former passage of a larger body of water than that which now flows away through it? There are good grounds for supposing that an actual increase in the breadth of this channel has taken place even in historical times; and such a breadth may have been due to the action of a former, greater issuing stream. The following figures, taken from Rawlinson's *Herodotus*, show the increase of breadth alluded to, in *stadia*:—

| According to | Herodotus. | Strabo. | Pliny. | Actual. |
|---|---|---|---|---|
| Breadth of Bosphorus is | 4 | 4 or 5 | 4 | 6¼ |

Here then we have strong indications of an increase of breadth of more than 50 per cent. during the past eighteen centuries; and such an enlargement may very well be assigned to the action of a larger volume of water flowing out of the Black Sea basin in former times. And as to this, it is a sufficiently curious coincidence, that the volume of 8000 cubic yards per second, representing the estimated difference between the quantity actually now issuing from the Black Sea basin and that which the dimensions of the Bosphorus might actually carry, equals precisely the greater portion of the stream of the Volga, already shown as having in all probability passed into the *Palus Mœotis* in former times.

Under such conditions, t is evident that the waters of the Black Sea should have been very much less salt than nowadays. The present salinity is accounted for in various ways, all of which attribute an entry of the waters of the Mediterranean into the Black Sea basin. P. von Tchihatcheff says that a central stream descends in the Bosphorus between two lateral ascending currents, while Reclus believes that two rivers are always superposed in the Bosphorus, an ascending and heavier one of salt water, which flows along the bottom, and a descending and lighter stream which passes on the top of the first. Lyell deduced from Spratts' researches, that the salts of the Black Sea are due to a strong reverse current of the Mediterranean waters, which are driven northwards during the autumn and winter months; when the former sea is at its lowest level, and when that of the latter is raised by strong westerly gales. All of these explanations are consistent with the present superfluous dimensions of the Bosphorus, and do not conflict with the supposition that in former times a larger body of water might have been flowing through it, and that consequently the issuing stream might have been entirely of fresh water, or very nearly so.

The salts held in solution by the waters of different seas are shown in the following table, taken from the *Journal* of the Russian Geographical Society for 1873.

| | | | | |
|---|---|---|---|---|
| The Atlantic | has 42 | parts salts | in 1000. |
| ,, Mediterranean | ,, 39 | ,, | ,, | ,, |
| ,, Black Sea | ,, 18 | ,, | ,, | ,, |
| ,, Caspian | ,, 15 | ,, | ,, | ,, |
| ,, Aral | ,, 13 | ,, | ,, | ,, |

The question remains, whether there is any evidence from which conclusions can be drawn as to the amount of salinity actually possessed by the Black Sea water in former times? If we find that this was probably fresher, a greater discharge must formerly have passed by the Bosphorus from this basin, and its tributary rivers must have afforded it a greater supply; a condition of things which would fortify the proposition that the major portion of the Volga waters used to flow into the *Mœotis*.

The ancient writers certainly held very decided opinions regarding the small proportion of salt contained in solution by the Black Sea, and P. von Tchihatcheff, indeed, in his *Asie Mineure* observes that they exaggerated the sweetness of its waters. Aristotle (Animal Hist., b. xvii. c. 5) tells us that the Black Sea water was fresh; which statement is confirmed even some four centuries later by Pliny (b. ix. c. 15), as well as in the century subsequent to this naturalist, by Valerius Flaccus (Argonauticon b. v., vers. 721). At this last epoch Arrian (Epistola ad Adrian) says the people watered their flocks in the Black Sea, and that the waters were very wholesome. Two centuries previously Ovid, from his exile on the shores of Pontus (Pont., b. iv., letter 10, vers. 62), accounted for the sweetness of its water, by supposing that the streams of the rivers tributary to the basin floated like a sheet on salter water.

The statement of Arrian is very decisive of the increase of the saltness of the Black Sea waters since the 2nd century of the Christian era; for it can scarcely be supposed that these waters are now wholesome drinking water for animals. That of Lake Aral, which contains five parts less in one thousand of salt in solution, are potable only under compulsion by the cattle and antelope, which are found on some of the larger islands at the present time; and such a circumstance is a very practical condemnation of those of the Black Sea. It is difficult then to escape the conclusion that these latter have increased in saltness since early historical times, and a decreased issuing stream by the Bosphorus is in this manner indicated.

The considerations which have been submitted to the reader in the foregoing paper, point therefore to the strong probability that in ancient historical times the Volga, or at least a large portion of its stream, had an outlet in the *Palus Mœotis*.

Such a diversion of the river would necessarily have caused a considerable fall in the level of the Caspian Sea, and some evidence has been adduced that the aspects which have been recorded as attaching to the basin in former times, were actually such as it would have possessed at an epoch when it did not receive the volume of water that is now poured into it by the Volga. It is daily becoming more clear that except the fact of there having been at different times more or less water in the various basins, which are the remains of the fresh water Asiatic Mediterranean (whose surface was situated at a height of about 220 feet above the ocean), no change whatever has taken place in the several portions of the bed of that prehistoric sea. Thus the uniformity of those laws that regulate the modifications of the earth's surface are vindicated, in localities where violent and abnormal phenomena have been perhaps more than elsewhere adduced, in order to explain the difficulties which stood in the way of physical geographers.

HERBERT WOOD.

P.S.—At the present day, when an enterprise like the Suez Canal exemplifies in the most forcible manner that close connection existing between geography and politics, which Strabo contended for some 1800 years ago, it may not be amiss to say a few words on the junction of the Black and Caspian Seas, which was discussed by Mr. D. Ker in the last number of the *Geographical Magazine*. In the paper now concluded, evidence has been submitted to the reader which points to former physical aspects in the Caspian basin, differing very widely from those existing at the present day; and it can very easily be shown what still greater changes could be brought about by a very moderate expenditure of labour and money.

Though the present Caspian level is 84 feet (about) below the ocean level, it must be remembered that the highest point in the Manytch Channel, connecting the Euxine and Caspian basins, is but 24 feet above ocean level. Manifestly therefore if these 24 feet were cut through, the waters of the Sea of Azof would pass into the Caspian basin and fill it up. Nor would such an enterprise present the shadow of a difficulty to the engineering genius which has already brought into being the great excavators that were used on the Suez Canal.

The result of the filling up of the Caspian basin would be the destruction of Astrakhan, and of all other buildings situated below ocean level on the Caspian littoral, and the project therefore would not appear at first sight to be a desirable one. But when it is considered that its execution would increase the water-spread of the Caspian from an area of 140,000 square miles to one of 250,000 square miles; and that the evapora-

tion from this increased water surface would certainly ameliorate the present desiccated condition of Western Turkestan in a very important way, the first unfavourable look of such an enterprise is modified.

If further, it be considered that the Oxus, after providing for the cultivation of the Khivan oasis, now pours into Lake Aral water sufficient to fertilise a great deal of the desert on its west bank, the importance of the connection of the Black Sea with the Caspian becomes more manifest. Such a junction would provide an ocean route to the eastern shore of the latter sea; from which a belt of habitable country would replace the existent desert, and provide that line of communication for want of which the development of civilization in Central Asia has hitherto been retarded. The finest cotton and silk producing districts in the world would be so thrown open to general commerce, and Russia, in applying her energies to such a project, would, in point of fact, be manufacturing for herself that Asiatic El Dorado which the foresight and genius of Peter the Great taught him instinctively to look for in these now isolated regions.

H. W.

## DR. BECCARI'S RECENT VISIT TO NEW GUINEA.

WHEN I last wrote in these pages, our distinguished traveller was on the eve of starting for a second exploration of New Guinea; in the April (1875) number of the *Geographical Magazine*, I told you how he had succeeded in hiring the schooner 'Deli,' and was to leave Amboina for Geelvink Bay on the 20th of January, 1875; I also gave his proposed itinerary. Since then the voyage has been accomplished; and although Beccari was unable to proceed as far east as he had wished, yet he has been thoroughly successful, and has returned loaded with collections, and after having culled an extraordinary amount of new information on the still veiled and mysterious Papuasia. I add a translation of some of the letters he has sent home, which are most interesting:—

"DOREI, *June 5th*, 1875.

. . . . . "On the second of this month I returned from the exploration of Geelvink Bay, to find here the Italian frigate 'Vettor Pisani,' to my no small surprise; through her I got my letters, dated many months back. I will now tell you of my doings since I last wrote. On the 22nd of January I left Amboina, and reached Salwatti on the 31st; the next day I proceeded to Sorong, and thence made an excursion to Ramoi. I was there able to secure splendid specimens of the *Casuarius uniappendiculatus*, two adults, male and female, and two young ones: one of the latter has been embarked alive on the 'Vettor Pisani.' I did not succeed in getting the *Tanysiptera nympha*. It being war-time at Sorong, I was able to procure a Papuan head, freshly cut off and *cooked*, but not for eating, merely for facilitating its preservation. It is, however, true that these Papuans drink the blood which drips from a newly-cut head, if the late owner thereof proved himself a man of valour by a vigorous defence; they believe thus to imbibe part of his courage. It appears certain that the boat's crew of the 'Franz' was murdered *by order* of the Rajah of Salwatti at Tangion Selé at the entrance of Seilolo Strait and not at Krabra near Efmatal Island, as the rascally Rajah led Captain Redlick to believe. From Sorong I went on to Dorei Hum, and thence I climbed up a mountain, Gunong Morait, about 3000 feet high; from its summit the principal river of the N.W. peninsula of New Guinea, and which I was told rises in the Arfak Mountains, ought to be seen. On the top of Gunong Morait I shot two fine specimens of that remarkable Parrot, *Dasyptilus Pecqueti*, the only specimens obtained as yet; its tongue does not end in a brush, but is instead minutely papillose. I also collected several fine botanical novelties and some handsome insects. It appears that the *Lophorina atra* and the *Parotia sexpennis* inhabit that mountain as the *Diphyllodes speciosa* certainly does, as I procured several specimens myself of the latter species. Not being quite satisfied with my first excursion, I went on to Has, from whence I again climbed up the mountain range which seems to line everywhere the N.W. coast of New Guinea. I reached an elevation of about 1200 feet; at a charming spot I crossed the mountains, and soon arrived on the bank of the river Wa Samson, *i.e.* 'turbid water' for it is ever muddy. At that spot the river was about 20 meters wide, to judge by sight, perhaps more; the depth was from 3 to 4 meters, and the current strong; the river was evidently then low, for the banks were vertical and the level of the water at least 3 meters below that of the forest, in which unmistakable signs of frequent inundations could be traced. I was told that near its mouth the Wa Samson tunnels its way under a mountain, and that it falls into the sea from a considerable height, hidden amongst rocks a few miles west of Has. This explains how nothing can be made out of the aforesaid river while coasting, the change in the colour of the sea could alone indicate its whereabouts. During that excursion I obtained the *Seleucides alba*, and saw *Sericulus aureus*, *Gymnophaps Albertisi*, and several other rare birds, besides others probably still unknown, amongst which what appeared to be a *Pitta*. I then decided on returning to Sorong; but on nearing Tangion Ram I was overtaken by a hurricane, and had a very narrow escape of being totally wrecked; with much difficulty we succeeded in keeping afloat, and thus saved the collections and probably our lives; we were, however, obliged to throw overboard the heavier objects, and to my great grief a large supply of alcohol; this happened on the 3rd of March. The following day I reached the schooner at Sorong; on the 5th we started for Waigheu and anchored at Wakkeré, where I remained four days searching for *Diphyllodes Wilsonii*; it was only on the last day of my stay that one of my men managed to secure a fine male specimen. I was there told of an *Epimachus*, which is perhaps the *E. Elliottii*, for the coloured drawing of that species was at once recongized by the natives to whom I showed it; they call it *Man Xullo*, and stated that three specimens had been recently sent to the Sultan of Tidore. It appears, moreover, that the same species is to be found near Sorong, where it is called *Kalem-mu*. The *Diphyllodes Guglielmi III.* is not found, I believe, at Waigheu. I got news of that species at Salwatti; it is also found in the neighbourhood of Sorong. Another *Diphyllodes* is described by the natives. I cannot make out what it can be: it is found in the mountains of Salwatti. I was two days in getting from Wakkeré to

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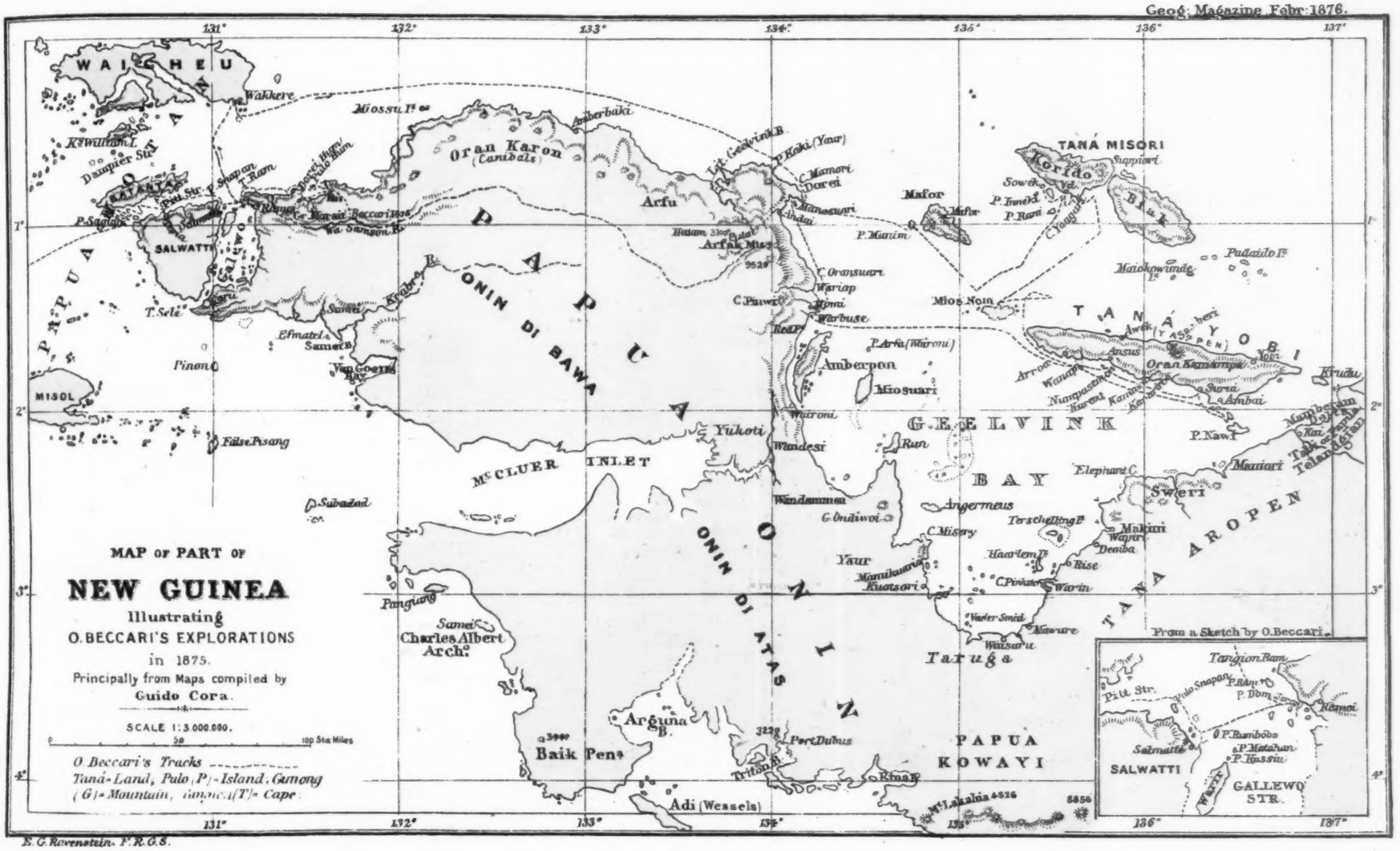

Dorei, and after a trip to Andai, I started again on my voyage round Geelvink Bay. It will be here necessary to follow my route on the small sketch-map I enclose; be it however understood that you give no more value to it than it deserves; it was merely drawn to show the spots I visited, and no more. Part of it is a tracing of the English Admiralty chart, but there are many alterations. Not a single point was, however, determined astronomically by me, and the compass observations were necessarily very rough; I believe, however, to have ascertained that Geelvink Bay is much less extensive than it appears in the Admiralty chart, which is evidently constructed on the original Dutch map, drawn by the officers of the 'Geelvink' in 1705. I have a copy of the latter, given to me by Dr. Miclucho Maclay. This comes from the fact that Dorei is the only spot, the position of which has been repeatedly verified, and which is therefore given exactly; the remainder of the bay has never since been surveyed. Besides the considerable reduction in the extension of the bay, it should be recollected that it is considerably more shallow than given in the maps. I found out this while I was at Ansus, whence the mountains which line the bottom and the whole contour of Geelvink Bay are plainly visible; this would be impossible were the distance given on the maps exact, for in these climates the constant haziness of the atmosphere prevents the sight of land at a distance greater than 70 or 75 miles; the depth of Geelvink Bay should be reduced at least half a degree. Even the position of Oransuari is placed several minutes too much to the south in the English charts, an error which does not exist on the French map.

"From Dorei I went to Momi and Warbusi. At the former place I purchased a young cassowary, which is probably a new species, although not old enough to show all the differential characters; it is, however, very distinct from all those which I have seen, and from those indicated in Schlegel's *Synopsis*, in the distribution of the wattles, of which two big ones are placed high up on the fore part of the neck, while a smaller spherical one is placed much further down; the helmet is not fully developed, but it will probably turn out to be high and compressed. I also enclose the coloured drawing of the head of another species of cassowary found at Jobie, the skin of which is preserved in alcohol; in my specimen the skin of the neck is unfortunately lacerated in the place where the wattles ought to be, I cannot therefore be sure that they do not exist; there cannot, however, be more than one, and that about the size of a pea, solitary and central. The helmet is anteriorly compressed, but depressed and flattened posteriorly, showing a surface about 2 inches broad; thus this species appears to unite in the helmet the distinctive characters ascribed by Schlegel to the two sections which he has formed of the genus *Casuarius*. The above-named naturalist is mistaken in asserting that each species of cassowary is limited to a special locality. In Salwatti and on the Papuan Main, there are at least two species, which the natives readily distinguish; moreover, non-sexual external characters are to be observed in the *Casuarius uniappendiculatus*. Probably the species I procured at Warbusi is the one which is said to accompany the latter. Here, at Dorei, two species of cassowary are certainly found. I have specimens of both; one is the above-mentioned undetermined species, the other is the *Casuarius papuanus*, of which I have a young specimen. Again, at Ansus, there appear to be two species of these singular birds; the natives told me that the two sexes are very distinct in both forms. At Amboina, also, there appears to be a peculiar species of *Casuarius*, different from that of Ceram.

"At Warbusi I was able to secure good specimens of the *Sus papuanus*. I proceeded thence to Ansus, where I stayed a fortnight; I got there several specimens of the *Paradisea papuana*, slightly different from the mainland birds. Two specimens of the *Diphyllodes speciosa* were also procured: they have the bill longer, and the yellow on the wings brighter than the specimens hitherto collected. I then coasted along the southern shore of Jobi, with the intention of proceeding to the mouth of the Ambernoh River, but the season was too far advanced; I met with contrary winds and was obliged to return. On my way back I stopped at Miosnom Island, which is interesting to the geologist, being volcanic. I found three or four small harbours, which appear to be submerged craters. In all the other islands and on that part of the mainland where I have been, the rocks were all stratified, except the Arfak Mountains and a portion of the northern coast, principally composed of granite. The natives at Ansus (Jobi) told me that an active volcano is visible from the sea on the other side of Humboldt Bay. The aborigines at Ansus are quite inoffensive. I got on very well with them. They have the strange custom of mummificating their dead. The *Orang kamampa* of the interior and mountainous parts of Jobi, on Mount Samberi are said to be cannibals. I went also to Korido, Kordo and Sowek; between Kordo and Biàk a small channel is open, only available to small canoes. Sowek is a small island near Kordo; here I obtained about 200 Papuan skulls, robbed by the natives of Kordo from the island-cemeteries where they were accumulated; this has led to a war between the people of Kordo and those of Sowek. I employed a couple of days from Kordo to Mafor, whence I started on the 1st of June for Dorei. I have obtained no less than forty specimens of the *Tanysiptera Carolina*. My bird-skins amount at present to about 1400; of these more than 200 have been prepared by David, whom I found here. He had shortly before returned from Hatam, where he was able to obtain some of the most gorgeous and rare species—*Astrapia nigra*, long-tailed *Epimachus*, &c., &c. About 180 bird-skins were obtained at Ansus, 90 at Miosnom, 307 at Kordo, 113 at Mafor; the remainder from other localities; about 500 skins were collected in May. The reptilian collections are also rich. I might have done much more had I a larger supply of alcohol; as to fishes, I might easily have filled ten large barrels of fine species.

"As soon as the flag of my schooner could be made out from the shore at Mansinam, the commander of the 'Vettor Pisani' came to meet me in his steam-launch, and towed me to the anchorage. I at once went on board the frigate, where, as you may well suppose, I met with a very cordial reception. As soon as the 'Vettor Pisani' sails, I shall prepare for the journey to Hatam, which is not so easy, for the Arfak people have murdered one of Bruijn's hunters at Andai near the missionary's house. In my next I will tell you how I failed in reaching and ascending the Mam-

beram (Ambernoh) River. On the whole, I am well satisfied with the results of my exploration. I shall probably be at Ternate at the end of August, and thence I shall go to Batavia. I am well in health, and have not had a single attack of fever. I hope much from my trip to the mountains. During this season only one male specimen of *Drepanornis* has been obtained: I hope to get some. I have not done very much in insects. I have, however, collected a certain number of *Buprestidæ* and *Eupholus*, a few *Cetoniæ*, many *Brentidæ*, and a single specimen of *Tmesisternus Isabellæ*. I believe I have all the species of birds described by Dr. Meyer. Besides those mentioned, I have two species of *Nasiterna*, another is found at Hatam; many other Parrots; *Corvus senex*, which is very common; many pigeons, amongst which some ten specimens of the *Goura Victoriæ;* the *Cuculus lencolophus*, the *Chrysococcyx Meyeri* and allied species, one is not bigger than a *Nectarinia;* most of the Kingfishers; *Melidora*, several *Podargus;* three Striges; some Sun-birds, allied to *Nectarinia Aspasia; Myzomela* and many *Meliphagidæ*. I have most of the species of reptiles collected by Dr. Meyer; three or four specimens of the green *Varanus*, and only three species of *Hydrophidæ*. The day before yesterday one of my men saw a gallinaceous bird as large as a *Megapodius*, with a white head and a tail like a cock; what can it be? The 'Vettor Pisani' leaves to-morrow, 8th June."

This letter, and another one dated from Andai, June 15th, are directed to the Marquis Doria. In the latter Beccari tells us that he was on the eve of starting for Hatam, but that he had encountered many difficulties in arranging for the excursion. At the end of October several letters reached us, dated Hatam, June 21st, and Ternate, August 26th; in the first Beccari tells us how his collections were rapidly increasing, and how his health was never better, in the latter he gives an account of his final doings in New Guinea, and his return to Ternate. I add an extract from one of his letters from that place. He answers my objections to his hypothesis regarding traces of Hindu blood amongst the Mafor Papauns, sending me a drawing of one of their *Karwars* or so-called idols, which has an unmistakable elephantine proboscis. I am sorry to say that he has not converted me; but let me give his own words:—

"TERNATE, *September 11th*, 1875.

. . . . "In one of the cases I have sent there are two Papuan idols for you. I may here remark that these so-called idols, or *Karwars*, are not objects of real worship, being, in fact, the effigies of ancestors or defunct personages, parents, or friends. I have many proofs to give you showing that the Mafor are true Hindus, with an admixture of Papuan blood from the female side; but I will content myself for the present in enclosing the sketch of a Karwar, which will surprise you. Who ever taught the Mafor to represent the elephant in their *Karwars?*"

According to what Beccari says, the Papuan *Karwars* are much the same as the *Tikkis* of the Maories and other grotesque quasi-human figures sculptured in wood by not a few of the islanders of Polynesia and Melanesia. One of Beccari's most interesting letters is doubtless the one which he addressed on the 4th of August, from Ternate, to our leading ornithologist, my friend Count T. Salvadori. of Turin; it is mainly ornithological, and very lengthy, I will not, therefore, give a complete translation of it, but a few extracts will no doubt interest the readers of the *Geographical Magazine*, giving as they do further details on his last excursion to the Arfak Mountains.

. . . . "The ornithological and other collections made during my last trip to New Guinea are ready to be shipped for Italy. The Papuan birds are more than 2000. . . . . In the letter I wrote to Doria from Dorei, I told of the route I had followed up to that date. As soon as the 'Vettor Pisani' left Dorei, I went and anchored my schooner near two islets at the mouth of the Andai River; thence I could more commodiously make my preparations for ascending the mountain. I was able to get as high as 6700 feet, and thence I could see all the greater heights, and doubt not that the highest peak of the Arfak Mountains reaches 10,000 feet. I have seen that Von Rosenberg gives as the habitat of various species of birds, 'the interior of the northern peninsula of New Guinea.' I do not know what he means by that *interior*, for the most distant spot from the sea reached by Von Rosenberg in New Guinea is the house of Heer Waelders, missionary at Andai, not a kilometer from the sea-shore. That is also the locality visited by Dr. Meyer. The hunters of Von Rosenberg only ascended the first slopes of the Arfak Mountains, and the fact that they found a few only of the characteristic species of birds, shows that they did not push very far from the sea. Dr. Meyer's men went further inland, and stopped at a place called Warmendi; very few were the birds they obtained in this first excursion, and on their return to Andai they were sent back to the mountains. On this second occasion they reached a greater height, but did not go as far as D'Albertis had gone before them. Shortly after D'Albertis and I had left Andai, Heer Waelders sent to Hatam some of the Papuan mission boys, who knew something of bird-skinning; from them he obtained most of the mountain species, which were, in March of the following year, bought by Dr. Meyer. It must therefore be distinctly stated that up to the present date only Italian travellers have had the good fortune to collect the rarest and finest birds of paradise in *their native forests*, and to lift the veil of mystery which hitherto hung over their true habitat, which had deterred former travellers from attempting to penetrate the country; and even Wallace, who speaking, not without good reasons, of the country inhabited by the rarest birds of paradise, describes it as 'rocky and mountainous, covered everywhere with dense forests, offering in its swamps and precipices and serrated ridges an almost unsurmountable barrier to the unknown interior' *(Malay Archipelago*, ii., p. 424).

"I remained a month in the mountains, first at a locality about 5000 feet above the sea, then lower down at the place where D'Albertis stayed, about 3500 feet above the sea. My intention was to have remained another month, but a letter from Heer Waelders (which I received contemporaneously with new provisions) told me that all the men I had left on board my schooner were ill with the dreadful *beri-beri;* and besides that, several troops of other Arfak tribes were not only on the look out for the heads of my men, but had undertaken to get my own. I

learnt that about 500 Papuans, from as far off as Amberbaki, had united to surround me. They must indeed have had a grand notion of my person, if to take me and the five men that were with me they had mustered 500 strong! They had already twice attempted to burn the missionary's house. The reason of all this was that when the hunters of Heer Bruijn arrived at Andai to explore the Arfak Mountains, one of them was killed by the so-called Alfuros, and his head, carried in triumph, made the round of the villages of that tribe. The brother of the murdered man, an Alfuros of Galega, thought himself in duty bound, according to the custom of the country, to avenge his dead brother; thus one day, while I was at Dorei, and the 'Vettor Pisani' was yet there, he quietly landed and managed secretly to kill two of the Arfaks. It appears that he hid the heads and managed to throw the bodies into the sea; for the two men were soon missed by their friends, but their search for traces of them or their bodies remained fruitless. In the end the Arfaks came to the conclusion that their two companions had been either killed or robbed by the sailors of the 'Vettor Pisani,' which had sailed about the time the search had been given up. It was thus that they wanted to take revenge on me, who had remained. I can, however, assure you that I have no very high opinion of the courage of the Papuans, and had I not received such bad news of the health of my people on board the 'Burung Laut,' I should not have hurried back to the coast. When I reached Mansinam I found that the bad tidings had not been exaggerated; two of my men had died, and the rest were more or less ill. Fortunately the captain and boatswain were only laid up with fever; only one seaman was able to work. The best I could do was evidently to get away from the miasmatic influence. I got another seaman from a boat lying near mine, and with my hunters, all more or less sea-worthy, managed to get away. On the 18th of July I left Mansinam; on the night of the 21st I was at Salwatti. On the 23rd I went to Batanta, where I remained four days, and then proceeded to Koffiao, erroneously called *Poppa* on the maps; but I only stopped 30 hours, for on the way three more men died and several of my hunters were taken ill. It was high time to hurry on to Ternate. I was, however, able to get 40 bird-skins at Koffiao, amongst them are the *Tanysiptera Elliotti*, a *Pitta* and *Rhipidura viduata*. On the evening of August the 4th I reached Ternate."

Beccari's intentions were to go from Ternate to Menado, and thence proceed to Java, where he will pass the winter, studying the plants he has collected at the Herbarium of Buitenzorg. Beccari appears to have reaped a large series of botanical novelties, amongst which a new *Araucaria* and new Rhododendrons from the Arfak Mountains. Beccari will in all likelihood return to Europe in the spring, unless he yields to the strong desire of exploring the interior of Sumatra.

In my next I shall inform you on the doings of our other Papuan traveller, L. M. D'Albertis, who has sent interesting letters from Yule Island, where he has passed most of 1875.

HENRY H. GIGLIOLI.

# Reviews.

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## KASHMIR AND KASHGHAR.*

IT is probably due to the care displayed in the selection of the *personnel* of the recent mission to Kashghar, that no less than five historiographers have uprisen since its close, while had not death robbed us of one of the ablest of its members, a sixth might have been added to the list. The volume we are here concerned with is from the pen of Dr. Bellew (known for his previous works on the Kandahar Mission in 1857-58, on the Yusufzai region, and on the Persian and Sistan Missions, 1871-3.

Dr. Bellew in his preface appears loth to tread where Messrs. Shaw, Henderson, and Hume have preceded, and he is careful to offer us what he terms a plain account of the journey and experiences of the embassy to Kashghar in 1873-74, with the addition of a few matters of interest regarding the people and the country. But every scrap of information concerning Kashgaria is valuable, and peculiarly so, considering the uncertainty of its destinies, overshadowed as it is by the might of Russia and China. Indeed it is the very insecurity of the Amir's rule which has led him to cement his good understanding with Russia and England by means of missions and treaties of commerce, and to this may be attributed the immense increase during the last six years of our knowledge of regions to which China would probably have barred our approach as effectually as she does to Tibet.

In *Kashmir and Kashghar* the reader's attention naturally reverts to the latter half of the volume, although we cannot forbear pointing out *en passant* that Dr. Bellew, whose experience dates over some years, has a good word to say for its much-abused Maharajah and his treatment of European visitors. The facilities afforded to visitors to the first-named principality has resulted in making us all pretty familiar with the Happy Valley, the Floating Gardens, the bright-eyed Kashmirians, and their ingenuity in handicrafts. The barren and mountainous region to the north and east is less known and, as the narrator proceeds to describe it, one begins to experience a feeling of fascination like that felt in following a description of Arctic travel. The almost total absence of vegetation, the surrounding ice and snow, and the frequency of skeletons and bones of horses, yaks, and even of men, combine to make a picture of desolation. Add to this that the enormous height of the passes is attended with a rarefied atmosphere, which has a most distressing effect on travellers, and causes nausea and violent headaches. Dr. Bellew found that a pinch of chlorate of potash eaten now and then afforded great relief in such cases, and future travellers will do well to attend to such a valuable hint.

However, the Karakorum range was eventually passed, and on the 8th of November, 1873, the party entered Yarkand. Dr. Bellew's description of the city will well repay perusal. He remarks that he never saw a more quietly conducted crowd than those they passed through before entering the city. The different types

**Kashmir and Kashghar.* By H. W. Bellew, C.S.I. London: Trübner and Co., 1875.

of population which here congregate must present a very remarkable *tout ensemble*. The gaunt, thick-complexioned Manchu, with his sunken eyes, high cheek bones, and projecting jowl, the fleshy, smooth face and pinky yellow colour of the Kalmuk, with his oblique eyes, flat cheeks and rounded jowl, form two extremes of plainness; while the bearded, sallow-skinned Turk of the country, the angular rosy-faced Kirghiz of the Steppes, the coarse-featured, hard-lined Tungani, and the thick-lipped, square-faced Khitay, all helped to make up an assemblage of respectful, but surpassing ugliness. The town itself is built of raw bricks and clay, and has the same untidy look that most Central Asian towns have. But the manners and customs of the people are strangely European, and Dr. Bellew tells us the visitor might easily fancy himself in some country town of Eastern Europe. The people are of so light a complexion that an Indian looks like a black sheep in the fold; in place of folds of muslin and gauze, or close shapes of calico and print, one sees loose robes of buckram and frieze, or capacious wraps of bold-coloured silks and heavy fur. The groups of rosy, comely women doing their marketing, reminded Dr. Bellew of a market-scene in Buda-Pest. But it would appear to be in the eating-house that the likeness is most striking. The visitor enters, we will say, and takes his seat on a wooden bench, which might have been made by an English carpenter. A veritable waiter, napkin on arm, appears, and sets before him a china bowl on a willow pattern plate and porcelain spoon. The fare comprises soups of vermicelli and maccaroni, stews and ragouts, joints of mutton, beef and horse, not torn with the fingers as in Afghanistan, but carved with the knife. There is also pastry of all sorts, and puddings and salads to be had. The *menu* was formerly more extensive, and embraced dog, rat, cat, pig, and ass, but these Chinese delicacies have been now prohibited under Islam as unlawful. Yarkand has no special manufacture, but it has a local reputation for the superiority of its leather for boots and shoes, an industry which, with those of the furrier and hatter, employs some hundreds of families. The jade quarries in the Karakash Valley, near Yarkand and at Khutan, and the gold mines in the southern hills, furnished occupation to several thousands of families during the Chinese supremacy, but both industries have since unfortunately lapsed.

The Ataliḳ Ghazi, the energetic, self-constituted ruler of this principality, is described as a middle-aged, stout-built, and plainly-dressed man of about 50 years of age. His face presents no single feature with undue prominence, and seen in a crowd would pass unnoticed as rather a common sort of face, yet it somehow conveys the impression that the expression is more assumed than natural. The forehead is full and, high and, without a trace of a frown or wrinkle, is displayed to full advantage under a well-set turban, the pure white folds of which rest high on the shaven scalp. The mouth is large, but not coarse, and the lips are thick and fleshy, but at the same time firmly set. Its expression is one of severity, though now and then in conversation the upper lip is curled for a moment with a very pleasant smile, instantly however to resume its studied expression of gravity, The eyes are full, and play under open brows, but they have no softness. The general expression is that of thought and melancholy; altogether the set of the features appears to be the result of studied gravity and reserve, and, though naturally the countenance is well-favoured, its general expression is not attractive.

As might be surmised, the rule of such a man is characterized by an uniform severity, profound secrecy and an imperious will, the caprice of which no man can foretell. It has, however, been so far successful in reducing the people to a state of complete discipline, and has well nigh banished violent crime from the city. During the three months of the stay of the mission at Kashghar they heard of only one murder being committed at the place.

Dr. Bellew gives us a very pleasing account of a hunting-party, in which two trained eagles were used. The golden eagle, which is the kind used, is a magnificent bird, of immense strength. It is hooded and jessied in the same way as the falcon, but owing to its great weight, is carried on a cross-tree of wood which is held in the hand and supported on the pommel of the saddle. It is used in hunting the pig, antelope, stag, and wolf, and any large game such as geese, herons, &c., while the ordinary falcons of Northern India are trained for hawking pheasants, bustards, wild duck, &c.

Regarding the question of trade, the author states that on the overthrow of the Chinese rule, ten years ago, the Southern States of Khotan and Yarkand turned to Kashmir and the Panjab for their markets, while the Northern States from Turfan to Kashghar resorted, in like manner, to markets on the Russian side of the northern passes. This state of affairs still subsists, and as the Amir has concluded commercial treaties with both powers, the question of success depends upon the merits of the rival traders. With the government, the British goods, viz., cotton prints, muslins, broad cloths, silks, &c., which are distributed in lieu of pay, will, probably, be in great request; while, with the people, the wares usually brought by Russian traders, such as brass candlesticks, iron cauldrons and other hardware, with tea and some coarse cotton prints of peculiar pattern, will, most likely, continue to enjoy favour. But the enormous physical difficulties of transit on the south, militate strongly against any possible great development of trade.

Many of Dr. Bellew's readers will probably have by them some map of Central Asia with which to follow the route. To those who have not, we would recommend Colonel Walker's four-sheet map of Turkistan, which is most minutely accurate; should this, however, prove unattainable, a small but serviceable map will be found in our number for May, 1875. In conclusion we must put our readers on their guard respecting the extraordinary system adopted in the spelling of the proper names. It does not accord with the nomenclature of any map which we have been able to discover, and metamorphoses the names beyond hope of recognition as effectually as the capacious lambskin dressing-gowns, presented by the Amir, must have disguised Dr. Bellew and his friends. Apart from this little peculiarity, we heartily recommend *Kashmir and Kashghar* as a most vivid and pleasant narrative of a remarkable and adventurous journey.

## GORILLA LAND AND THE CATARACTS OF THE CONGO.*

ONCE more the adventurous and brilliant Captain Burton comes forward to instruct us afresh on the subject of Africa. But this time he does not hail from the interior of the Dark Continent—that sensational spot to which all eyes are now turned, and which he was the first correctly to describe as a region studded with lakes—but from the western coast whose characteristics he knows as thoroughly as he does Fleet Street or the Boulevards. The notes which form the groundwork of his volumes were collected some time ago and put upon the shelf, and he has only now found leisure to arrange them. Meanwhile, everybody knows how in the interim he has roamed from land to land, seeking "fresh fields and pastures new," giving forth from a teeming brain enlightening studies of "the Brazil," and of the unexplored parts of Syria, and later still overhauling the affairs of Iceland, and showing the deserving islanders a way out of their stinted lot. If Captain Burton is not actually before the public, he has always got irons in the fire, is always preparing dashing surprises, and never fails to astonish the community either by his feats as a traveller or by the variety and unequalled extent of his knowledge and acquirements.

The fact that his book has been delayed matters scarcely at all, for as he knows only too well, "Africa moves slowly." If he were to repeat the journey to-morrow he would probably have very little to add, and although in matters of progress we have recently been exhorted to believe that Utopia is only another name for Time, the definition scarcely applies to Africa. The first volume takes us up the Gaboon River into the Gorilla country, and into the haunts of the renowned Fán cannibals. Captain Burton made a point of going over Du Chaillu's ground and editing his footsteps, and in some cases he confirms, and in others utterly puts to rout the statements of that tall-talking Frenchman. The second volume treats of the Nzadi or Lower Congo, one of the four great rivers of the African continent, about which at the present moment we can scarcely know too much.

On the whole, these volumes are not remarkable for adventure or excitement, and those who expect to be taken where the "white man" has never been, will be disappointed. Captain Burton's object is to inform, to present us with a realistic panorama, and to provide us with an edifying course of studies on the material aspects of the country and the morals of the natives. The Gaboon offers a curious picture of demi-semi civilization. In that maritime strip, bordered on one side by the Atlantic, and on the other by mountains which effectually separate it from the great undiscovered "White Blot," human nature is to be seen in its earliest stages of transition. Everywhere there are settlements, and what are flatteringly called villages, with factories and mission-houses and merchants speaking all the European languages. The traveller is pretty sure of food and of a couch of mats; he is civilly treated by "kings," who swarm in every locality, and he "can wander single-handed throughout the country." In these parts the negro has acquired a sort of surface regeneration; but Captain Burton, who knows our "black brother" to the backbone, shows us behind the scenes. He regards him as a provisional creature who has his day, and who will then pass away according to the programme, and clear the ground "for higher successors." They are all polygamists, and the women apparently thrive under the institution.—

"I should try vainly to persuade the English women that there can be peace in households so constituted: still such is the case. Messrs. Wilson and Du Chaillu both assert that the wives rarely disagree amongst themselves. The sentimental part of love is modified; the common husband becomes the patriarch, not the paterfamilias; the wife is not the mistress, but the *mere de famille*. The alliance rises or sinks to one of interest and affection, instead of being amorous or uxorious, whilst the underlying idea, 'the more the merrier,' especially in lands where free service is unknown, seems to stifle envy and jealousy."

Captain Burton draws a curious parallel between the creed of the African and our modern spiritualism. The connection between the two will, perhaps, not be so readily appreciated by Mr. Crookes or Mr. Wallace, who prefer a more scientific explanation. Spiritualism is the dawn of faith, and both systems, African fetishism and English spiritualism, require no belief in God or Devil, Heaven or Hell, reward or punishment. The future with them is a material future. The "spirit" of London drawing-rooms should be called a ghost; it wears garments, it can rattle its chains, it has submitted to be photographed. Again, with the African, the Creator is the unknowable as with spiritualists, and the unknowable is too high and too remote to be reached by human faculties. This African fetish is even higher than the belief of so great a philosopher as the poet of the East—Omar Khayyám, who can say of the potter, "He's a good fellow, and t'will all be well."—

"The civilized man would be apt to imagine that these wild African fetishists are easily converted to a 'purer creed.' The contrary is everywhere and absolutely the case; their faith is a web woven with threads of iron. The negro finds it almost impossible to rid himself of his belief; the spiritual despotism is the expression of his organization, a part of himself."

If there is any hope for the African, and if he is to advance a single step, Captain Burton thinks it will be through Muhammadanism. Since our abolition of the export slave trade, El Islam has made rapid strides. The negro used to be sold on the coast for $80, now the Houssa hunters buy him for $60, and at once convert him. The saving influence of the Prophet abolishes horrors, puts an end to witch-burning, twin-killing, "customs," and poison ordeals. There is only one serious drawback, and it will be considered overwhelming—Muslims will not become Christians.

Very interesting to the general reader who cares to study "primitive man," will be the revised account of the Fán cannibals. Du Chaillu, with his inventive pen, pictured a large-limbed, black-skinned, and ferocious-looking race, with large mustachios and plaited beards. Captain Burton, who puts us *vis à vis* with facts, describes "a finely made, light-coloured people, of regular features, and decidedly mild aspect." The chieftains affect strange ornaments, a pigtail, bound by the neck of a claret bottle being considered "swell;" whilst the women have a mania for decorating themselves with heavy masses of beads. The charge brought against them of eating "strange flesh" is not without foundation; yet, although their frailties are great,

* *Two Trips to Gorilla Land and the Cataracts of the Congo.* By Richard F. Burton. 2 vols. (Sampson Low, Marston & Co., 1875.)

calumny has made them greater than they are. At any rate, cannibalism is not an every-day luxury. The sacrifice of a "black brother" is accompanied by religious rites, women and children are banished from the ceremony, and the cooking-pots used at the feast must all be broken. The victim is generally an outsider, some foe slain in battle, and "if the whole body cannot be carried off, a limb or two is removed for the purpose of a roast." The reader who wishes to be further initiated into the revolting mysteries of anthropophagy, may learn from Captain Burton that the practice is no doubt due to the damp and depressing climate, and to the fearful crave for animal diet; while Dr. Schweinfurth, who also is deeply versed in negro nature, asserts that cannibalism "can co-exist with a considerable amount of comfort, and so to speak civilization." No wonder that Africa "moves slowly," and that travellers, who are confronted with such hideous facts, take a depressing view of negro possibilities.

It seems to have been Captain Burton's fate in these journeys to dispel illusions, and among other things he puts us to rights on the subject of the gorilla. But when the English mind has once taken up with an idea, it is not willing to part from it. M. Du Chaillu's statements boiled down, lose half their dramatic force, and the "ape of contention," as it exists on the Gaboon and the Congo, is not the formidable creature we have been led to believe. We must take the old romancing accounts with the following modifications:—

"The gorilla is a poor devil ape, not a 'a hellish dream-creature, half-man, half-beast.' He is not king of the African forest; he fears the Njego or leopard, and as lions will not live in these wet, wooded, and gameless lands, he can hardly have expelled King Leo. He does not choose the 'darkest, gloomiest forests,' but prefers the thin woods, where he finds wild fruits for himself and family. His tremendous roar does not shake the jungle: it is a hollow apish cry, a loudish huhh! huhh! huhh! explosive, like the puff of a steam-engine, which, in rage, becomes a sharp and snappish bark. Any hunter can imitate it . . . The eye is not a 'light grey,' but the brown, common to all the tribe. The gorilla cannot stand straight upon his rear quarters when attacking or otherwise engaged, without holding on to a trunk. He does not 'run on his hind legs;' he is essentially a tree ape, as every stuffed specimen will prove. However old and male he may be, he runs away with peculiar alacrity; though powerfully weaponed with tigerish teeth, with 'bunches of muscular fibre,' and with the limbs of Goliah, the gorilla, on the seaboard at least, is essentially a coward."

The traveller on the West Coast is not necessarily always confronted with horrors. If man is vile, nature is often lovely, and Africa can boast of "nestling spots of green for poets made." Captain Burton draws the most suggestive and provocative sketches. and at one spot on the Congo, where he stayed to collect flowers, he would fain persuade us that he had found the earthly paradise. He was equally charmed by "a remarkable feature of the coast," the savannahs of the Gaboon.—

"They are clearings in the jungle made by nature's hand, fenced round everywhere, save on the sea side, by tall walls of dark vegetation, averaging perhaps a mile long by 200 yards broad, and broken by mounds and terraces, regular as if worked by art. These prairies bear a green sward, seldom taller than 3 feet, and now ready for the fire: here and there the verdure is dotted by a tree or two. It is universally asserted that they cannot be cultivated; and if this be true, the cause would be worth investigating. In some places they are perfectly level, and almost flush with the sea; in others they swell gently to perhaps 100 feet; in other parts, again, they look like scarps and earthworks, remarkably resembling the lower parasitic craters of a huge volcano; and here and there they are pitted with sinks like the seaboard of Loango. These savannahs add an indescribable charm to the Gaboon Coast, especially when the morning and evening suns strike them with slanting rays, and compel them to stand out distinct from the setting of eternal emerald. The aspect of the downs is civilized as the banks of the Solent; and the coast wants nothing to complete the 'fine, quiet old-country picture in the wilds of Africa,' but herds of kine grazing upon leas shining with a golden glory, or a country seat, backed by the noble virgin forest, such a *bosquet* as Europe never knew."

With his passion for exploration, no wonder that Captain Burton again and again deplores "the huge vacuum" which lies a few miles behind the seaboard. He suggests that the Gaboon is by no means a bad starting-point, "whence the resolute traveller with perseverance (*Anglice*, time), a knowledge of the coast language, and good luck might penetrate into the heart (proper) of Africa and abolish the white blot which still affronts us." But England is apathetic, and only too willing to see her work done for her by volunteers, and at the cost of private outlay.

These volumes, cram full of information, brimming with suggestion, and almost bewildering in their lavish display of historical data, we must now leave to the reader. They have challenged a great deal of attention, and Captain Burton has been accused of violating the proprieties, and of using unnecessary plainness of speech. He has, however, strictly confined himself to the "veracities," and looked truth straight in the face. He is not governed by sentiment, but by a desire to describe things as he finds them; and it is his savage sincerity, his hostility to pretence of any kind, and his power of reproducing exact impressions, that give him such weight and authority as an author and a traveller.

A. L. BIRD.

## UNITED STATES OF NORTH AMERICA.*

MR. KING'S work, the first of two on the United States which we have placed together, is an amplification of a series of articles written on the fifteen ex-Slave States, for a monthly periodical, and for which he prepared himself by spending the year 1873, and the spring and summer of 1874, in travelling over and collecting statistics and information in the Southern States. The present volume is a quarto, of over 800 pages; but we hope our readers will not allow its size to terrify or deter them. We can assure them they will be amply repaid for undertaking its perusal by the amount of valuable information they will find presented to them in a pleasant and lively style, which, in but a very few instances, is disfigured by Americanisms, such as the corruptions *traveler* and *marvelous*.

The Southern States, besides their superiority in natural beauty, have a more picturesque history than the Northern ones; such of them as were founded by the French and Spaniards, still retain much to recall their origin, and possess churches, monastic and other buildings, which give them a venerable and old-world look. Many of these are well represented in the woodcuts with which, to the amount of more than 500, the book is embellished. The War of Secession, and the sufferings which followed the defeat of the South, awaken an interest and sympathy in its behalf, which the North, with

* *The Southern States of North America: A Record of Journeys in Louisiana, Texas, &c., &c.* By *Edward King*. London: Blackie & Son.

*Nebraska: its Advantages, Resources, and Drawbacks, Illustrated.* By *Edwin A. Curley*. London: Sampson Low, Marston & Co. 1875.

all its prosaic wealth and prosperity, fails to excite. The result of the war fell very unequally on the several seceding states; Louisiana, Alabama, and the two Carolinas appear to have suffered most severely. The depreciation of real property in Louisiana is such that lands, not very far from towns and trade centres, can be generally purchased at from $3 to $15 per acre, those more remote are only worth $1 or $1 50 cents per acre. A house in New Orleans, worth before the war $12,000, could not since find a purchaser at $4000. Many houses in that town are given rent-free to persons who will occupy them, to prevent their falling into decay. In Alabama the land is inexhaustibly rich, nevertheless that which before the war fetched $50 an acre, may now possibly command $10, or in some instances $5. During the three years preceding the war, South Carolina sent to market 54,904 bales of Sea Island cotton, but in the three years ending September 1873 only 23,307 bales.

Here is a description of the present state of Beaufort in South Carolina:—"I wandered through the town. It was evidently once very beautiful, and even now there are many remains of the ancient beauty. But a silence as of the grave reigned everywhere. Many of the mansions were closed and fallen into decay. . . . The whole aspect of the place was that which I afterwards found pervading other South Carolinian towns—that of complete prostration, dejection, stagnation."

It makes the blood boil to read Mr. King's account of the political corruption of the conquerors, their oppressions and confiscations, yet he writes temperately, and without exaggeration. The Act of Forfeiture of 1862 provided that if an owner of property in South Carolina failed to pay the amount assessed by the Land Commissioners within sixty days, his lands became forfeited to the United States! North Carolina has since the war become indebted to the amount of some forty millions of dollars, Mr. King exclaims, "The money had gone, alas! none but the thieves knew where; the plundered people only knew that out of $16,000,000 voted by the Legislature for *public works of improvements*, but $500,000 had ever been devoted to that purpose." These instances will suffice.

How unfit the negroes are to be entrusted with the franchise is abundantly shown. The force of habit is so great that although they are now at the top, and their old masters at the bottom, they still treat them with deference, touch their hats, and address them in terms of respect.

Florida enjoys the most temperate climate in the United States, though this State all but touches the 25th parallel of north latitude; the heat is never so great as in New York or Boston, or in Nebraska, according to the table of temperature given by Mr. Curley. The months of December, January, February, and March in Florida are described as absolutely perfect. This State will doubtless become the great resort of those suffering from pulmonary complaints in the United States.

We wish we could afford space to do more than call attention to Mr. King's descriptions of scenery—his account of the Indian reserves, and of the vast mineral wealth of the south, particularly of Alabama, Tennessee, Kentucky, North Carolina and Missouri. St. Louis, in the latter State, which has a population of 450,000, promises to rival Great Britain in the production of iron.

Notwithstanding its attractive binding of scarlet morocco, Mr. Curley's book is hardly one for the general reader; but for any one specially interested in or collecting statistics respecting the United States, and still more for those contemplating emigration, it contains a perfect mine of information. Mr. Curley has personally examined the greater part of the State of Nebraska, and he treats of everything connected with it in a thoroughly exhaustive manner. Here the emigrants will find how to get to Nebraska, and at what cost, the aspect of the country and character of its inhabitants, its geology and the nature of the soil, the price of land, the climate, the best crops to grow, the best methods of fencing, the management of cattle and sheep, the dangers from locusts and the way of overcoming them, the taxation, finances, exports and imports of the State—in short one may safely say that it would be next to impossible to suggest any enquiry respecting Nebraska, an answer to which would not be found in Mr. Curley's work.

Nebraska cannot boast of beauty, for nothing can well be more hideous than the country represented in the plates; but there is much to attract the emigrant, and those who are content, not only to leave the old country, but to change their nationality, will undoubtedly have as good a prospect of success in Nebraska as in any of our own colonies, and a better chance than in many of them! Here the advantages of a rich soil, as yet unbroken, are combined with many of the benefits of civilization, and though this State touches the 40th parallel of north latitude, it seems to be free from yellow fever; the soil is represented as most fertile, and the river communication is excellent, the Missouri bounding it to the east, and the Platte flowing through it from west to east. No doubt these rivers are frozen during the winter, for we learn from Mr. King that as far south as St. Louis, the Mississippi is sometimes closed by ice, and this in the latitude of Lisbon!

Mr. Curley whilst pointing out all the advantages of Nebraska and giving instances of success, is careful not to conceal the drawbacks. He "could not advise anyone with a family to leave steady employment at reasonable English wages and to come to Nebraska without money or friends or guaranteed employment."

The extremes of climate must be very trying to anyone coming from so temperate a country as our own; at Glendale in Nebraska the thermometer ranged from 30° in December, 1867, to 106° in the following July. A man must have both capital and a stout heart who can bear up against such a winter as that described at p. 381, or the ravages of locusts amongst his crops. We especially call attention to the chapter (No. xxii.) on locusts. The book is very well got up, and contains many diagrams and maps; but we must think the divisions of the maps into square miles by blue lines confuses them; too much indeed is attempted to be shown, they would be more practically useful were they more simple.

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MOROCCO AND THE MOORS. By *Arthur Leared, M.D.* London (Sampson Low, Marston & Co.), 1877.

MOROCCO lies within a fewdays' sail from our shores; there are a good many British subjects settled in its sea-port towns, carrying on their trade under the protection of a commercial treaty—and yet our knowledge of the country, particularly of the interior, is still very imperfect. Most of our trustworthy books on that empire have been published many years ago, and the account furnished now by Dr. Leared, though containing nothing to startle us, must therefore prove exceedingly welcome. Dr. Leared only passed a few months in the country. He cannot therefore perhaps speak with the authority of one who has spent there many years of his life, but we are amply compensated for this by the freshness of his narrative, by the minute and interesting details which he furnishes on every-day occurrences, which the old resident has become accustomed to, and therefore takes no notice of, but which nevertheless go far towards creating in our mind a faithful picture of the customs of foreign countries. The author, however, does not entirely trust to his personal experience. He was furnished with excellent letters of introduction, which admitted him to places generally closed against strangers, and brought him into contact with persons of much local knowledge and experience, and he has, in addition, consulted the most trustworthy writers on Morocco, who have preceded him. His accounts of various Jewish ceremonies are particularly complete, and his remarks on the climate of Morocco, and

ts suitability as a station for persons suffering from diseases of the chest, deserve all the more attention as coming from a physician who has given special attention to such cases. Dr. Leared was not fortunate enough to "interview" the Emperor at the southern capital, but he saw a good deal that was interesting in that city, and only turned his back upon it after an attempt had been made, by a fanatical portion of the inhabitants, to poison him. On his road to and from Morocco Dr. Leared observed the altitudes of a number of places, and thus added in a measure to our positive geographical knowledge.

The work is written in an attractive style, is well illustrated, and ranks high above the ordinary books of travel so plentifully published nowadays.

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THE INDIAN FORESTER: A Quarterly Magazine of Forestry. Edited by *W. Schlich, Ph.D.* October 1875. No. II. (Calcutta.)

THE second number of the *Indian Forester* fully sustains the promise of its predecessor, and shows that this valuable periodical has real vitality. It opens with a very interesting article on the forests of Darjiling, by Mr. Gamble. The second paper, by Mr. McKee, discusses the question of grazing, a most important one in connection with forest management; both from a forest point of view, and as considered with reference to the requirements of the people. The journal of a tour into the Karenee country, east of Torenghoo, by Mr. Ferrors, is also interesting. The number concludes with Mr. Gustav Mann's report on the caoutchouc plantations in Assam, and a translation of M. Planchon's monograph on the *Eucalyptus globulus*.

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THE FIRST FORTY YEARS OF INTERCOURSE BETWEEN ENGLAND AND RUSSIA, 1553-1593. Documents collected, copied and edited by *George Tolstoy*. (St. Petersburgh, 1875.)

THIS extremely interesting work consists of an introduction and a collection of well edited documents, illustrating the first negotiations between England and Russia. The work is printed in the languages of both countries. His Excellency George Tolstoy, in his introduction, bestows well deserved praise on the patriotic motives of Sebastian Cabot and the other Merchant Adventurers, on the heroism of Sir Hugh Willoughby, and on the ability and fidelity of Richard Chancellor. He then gives notices of the travels and negotiations of Anthony Jenkinson, Randolph, Bowes, Horsey, and the other English envoys sent to Russia by Queen Elizabeth, down to 1593 when, under Boris Godonof, there was an end of all cause of complaint against the Russian officials by the English merchants.

The documents, which form a most valuable collection of materials for history, commence with the Latin letters-missive of Edward VI. entrusted to Chancellor, and the reply of Czar Ivan. Then follow despatches illustrating the negotiations of Jenkinson, Bowes, Horsey, Fletcher, Cherry, and Lynde.

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MITTHEILUNGEN DES VEREINS FUR ERDKUNDE ZU LEIPZIG, 1874. Leipzig, 1875.

THE "Communications of the Leipzig Geographical Society for 1874," in addition to the annual report and the proceedings, contain papers on the trade in African beasts, by H. Leutemann; on magnetic observations in Palestine, by O. Kersten; on Venezuelan antiquities, by A. Goering; and on the meteorological observations made during the year at the Leipzig Observatory, by Dr. Bruhns. The Society at the close of 1874 numbered 13 honorary and 314 ordinary members. An anthropological museum, in connection with it, was opened on the 7th June, 1874, and is open to the general public on payment of a small fee. The income of the Society, including its Anthropological and African Sections, and the Karl Ritter Fund, amounted to 373*l*.

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LA PATAGONIA Y LAS TIERRAS AUSTRALES. Por *Vicente G. Quesada.* Buenos Aires, 1875.

SENHOR V. G. QUESADA, Director of the Public Library at Buenos Aires, devotes a bulky volume of nearly 800 pages to a discussion of the question whether the Straits of Magallanes, Tierra del Fuego, and Southern Patagonia, belong of right to the Argentine Republic or to Chile. He publishes, for the first time, numerous documents bearing upon the old boundaries of Buenos Aires and Chile, which were discovered by him in the Spanish Archives, and arrives at the conclusion, that up to 1810 Chile had acquired no right to the territory in dispute. A treaty between the two Republics having been concluded in 1856, in which the *uti possidetis* of 1810 is accepted, he looks upon the settlements subsequently established there as encroachments. We are glad to hear that this question is to be referred to arbitration. It is high time that it were settled. Nothing could be more deplorable than a war between two neighbouring Republics about an object of so small intrinsic value.

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DENKMALER DER KUNST: Bilder zur Geschichte Vorzugsweise für Mittelschulen und verwantle Lehranstalten, von *Josef Langl.* Erster Cyclus: Das Altherthum. Wein: Verlag von Eduard Hölzel.

THIS First Cyclus consists of twenty large pictures, 75½ by 57 centim. in size, printed in oils in imitation of the originals, executed in the style of sepia drawings. These are intended to be displayed upon walls in schools and lecture-rooms, to assist by ocular teaching, if one may use the expression, the pupil to follow more readily, and with greater interest, the lecture of the teacher, or the lesson to be learned. Schoolmasters have long felt the want of such aids; for wall-charts alone do not familiarize the pupil with objects and scenery of the countries, the geography or history of which at the time, is the subject of the lecture or lesson.

These pictures are most admirably produced by W. Hölzel's process of oil-colour printing. Seven subjects illustrate the history of Greece; five that of Egypt; two Assyria and Babylon; three ancient India, and three Persia.

A volume of letterpress (sold separately, so as to be available for pupils' use), consisting of 82 pages in royal 8vo., with illustrative cuts, accompanies the large portfolio with the pictures.

The work has met with great approbation in Germany from all the chief educational journals, and has been extensively introduced into middle class and grammar schools. Indeed it has only to be seen by principals of large and public schools to be introduced as filling up a want long felt.

# Cartography.

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## Map of the Environs of Philadelphia.*

MESSRS. BAKER, DAVIES & CO. have done a service to intending visitors to Philadelphia, by charging Mr. Bartholomew, of Edinburgh, with the preparation of a map of the environs of that city, which extends to a distance of 136 miles in all directions, and embraces the greater portion of New York, New Jersey, Pennsylvania, Delaware, and Maryland. The map appears to have been compiled with great care, is engraved neatly, and printed tastefully in colours. It shows the boundaries of counties and townships but, to our regret, takes no notice of the features of the ground.

* Centennial Map of Philadelphia and its Vicinity. By J. Bartholomew. Philadelphia, 1876.

## A Chart of the Suez Canal.*

MR. JOHN BARTHOLOMEW has prepared a chart of the Suez Canal, based upon French and English government surveys. It is supplemented by plans of Port Said and Suez, by a small map of the Delta of the Nile, and by a chart showing the routes from England and other European countries through the Canal to the East. The accompanying letter-press proves a welcome supplement. It appears that the tonnage of the vessels which passed through the Canal increased from 436,618 tons in 1870, to 2,424,000 in 1874, and that the receipts of the Company in the latter year amounted to £1,056,000, out of which £248,000 were required to pay current expenses, and £313,000 were available for the payment of a dividend upon the share-capital of £8,000,000. It would appear thus, that even from a commercial point of view, the purchase of a moiety of the shares cannot be condemned, though the other consequences drawn from this purchase may be exaggerated, just as Mr. Bartholomew has thought fit to exaggerate the breadth of the canal, in order to render it a more conspicuous object upon his map. E. G. RAVENSTEIN.

## Geological Maps of France.

THE first attempt at a geological map of France dates so far back as 1664, when the Abbé L. Coulon published a treatise on the Rivers of France, which was illustrated by a small map in which the more salient geological divisions are delineated with surprising accuracy—the general boundaries of the igneous and sedimentary rocks being very fairly shown.†

For nearly a century after this nothing more was done until J. E. Guettard, who was keeper of the Natural History Collections of the Duke of Orleans, brought out in 1746 a work in which for the first time the sedimentary deposits were mapped as separate layers.‡

His labours were confined chiefly to the northern half of France over which he followed the trend of the great series of secondary and tertiary beds with considerable skill. He did indeed, as the title of his memoir would lead one to suppose, carry his lines across the Channel, but his English geology was derived from information only, as he never visited England. Moreover, this information was not of a very trustworthy character since it induced him to state that coal-mines existed in Cornwall. Notwithstanding his errors, however, Guettard must certainly be looked upon as the father of French geological surveying, and his map, small and imperfect as it is, should hold a place with regard to France, little if at all inferior to that held by those of William Smith in the annals of British stratigraphical geology.

But Guettard was in advance of his age, and in 1778 his system of mapping rocks was ridiculed in a sneering tone by Buffon, who was no doubt instrumental in securing the appointment of Monnet, a mere mineralogist, by the Government to draw up a map of France, showing the mineral resources of the country. The result of this step was the publication by Monnet in 1780 (six years before Guettard's death), of a small portion of a map of France, on which the localities where minerals had been found were marked—in fact, simply a collector's map, having no claim whatever to be considered a scientific production.§ Lavoisier was officially associated with Monnet in this work, which, however, was soon put a stop to by the breaking out of the Revolution, and was never again resumed.

The principles which Guettard had worked out for himself in the middle of last century, could not fail sooner or later to be recognized as the only true ones on which a good geological map could be constructed, and with the advent of the present century Buffon's sneers and Monnet's system were equally out of date. It was not, however, till 1822 that another attempt at a representation of the topographical geology of France was made. In that year the late M. Omalius d'Halloy, the great Belgian geologist, and M. Coquebert de Montbret issued an excellent little geological map of France and the Netherlands,* but on a scale so small that the larger rock-masses only could be represented.

Soon after the publication of this map, in the same year, the activity of the official corps of Mining Engineers was stirred up by the appearance of Greenough's geological map of England, a copy of which had been presented to the Ecole des Mines. Without loss of time a project was formed for the carrying out of a similar map of France, and the actual work of geologically surveying the country was entrusted to MM. Dufrénoy and Élie de Beaumont, under the superintendence of M. Brochant de Villiers. From 1822 to 1825 the two former gentlemen were engaged in travelling about England, where they visited all the classical sections on which the then new theories of the great British school of geologists were based, as a preparation for the French field-work. This they began in 1825, M. Elie de Beaumont taking the country east of a line drawn across France from Honfleur to Alençon, thence turning to the S.E. towards Avallon and Châlon-sur-Saône, and finally following the course of the Saône and Rhône to the Mediterranean; M. Dufrénoy taking that west of this line.

Considering that the limits of the map were by no means the political frontier line of France, large portions of Belgium, Germany, Switzerland, Italy, and Spain being included within its scheme, and that the surveyors had but two assistants (MM. de Billy and Fénéon), it is astounding to find that in 1830 their work was done, and that the delay necessitated by the engraving of the geological lines alone prevented the immediate issue of the map.

Although unpublished, however, the researches of these geologists were freely consulted by the Government Engineers, who, in 1835, began to construct departmental maps—district maps by unofficial local geologists being as usual discouraged. The latter, however, were not idle, for a geological map of Savoy by Favre, one of the Seine Inférieure by Passy, and one of the Somme by Buteux, appeared in 1832. In 1835 a similar one of the Sarthe was published by Triger.

In 1841 the great government map was ready, and was issued to the public, together with a thick *quarto* first volume of explanations† and a small Index map which is to the present day the most convenient general geological map of the country. As the result of the work of two men, the large map, in six sheets, and on a scale of 1 : 500,000, is quite unique.

This same year a geological map of the Department of the Ardennes was published by MM. Buvignier and Sauvage, and henceforth departmental geological maps continued nearly every year to appear, the results both of official and private labour. The following is the order in which these maps came out:—

In 1843, of the Aisne, by the Vicomte d'Archiac.

In 1844, of Finistère, by De Fourcy.

In 1845, of the Meuse, by Buvignier; of the Maine et Loire, by Cacarrié, and of the Gard by Dumas.

In 1846, of the Aube, by Leymerie.

In 1848, of the Vosges, by De Billy; of the Tarn and of the Corrèze, by De Boucheporn.

In 1850 no less than twenty-four geological maps of departments were issued, viz.:—

Of the Cher and of the Allier, by Boulanger (the first was the joint work of Bertera); of the Haute-Vienne, by

* Philip's chart of the Suez Canal, with descriptive notes. London, 1875.

† "Les rivières de la France, ou description géographique et historique des cours et des débordements des rivières de France, avec le dénombrement des villes, ponts et passages." Paris, 1664.

‡ "Mémoire sur la nature et la situation des terrains qui traversent la France et l'Angleterre," 1746.

§ Description minéralogique de la France." Paris, 1780.

* *Annales des Mines*, t. vii., 1822, with observations, p. 353.

† "Explication de la carte géologique de la France," Paris, t. i. 1841, t. ii. 1848, t. iii. Part 1, 1873.

Mallard; of the Creuze, by De Cessac; of the Ardêche, by Dalmas; of the Calvados, by De Caumont; of the Cantal, by Baudin; of the Charente Inférieure, and of the Saône-et-Loire, by Manès; of the Côtes du Nord; of the Loiret, and of the Morbihan, by De Fourcy; of the Var, by De Villeneuve; of the Seine-et-Oise, by De Sénarmont; of the Drôme, by Gras; of the Gers, by Jacquot; of the Gironde, by Pigeon; of the Loire Inférieure by Caillaud; of the Cantal, by Ramés; of the Mayenne and of the Orne, by Blavier; of the Pyrénées, by Charpentier; and of the Haute-Saône, by Thirria.

In 1851, of the Pas-de-Calais, by Dusouich; of the Seine-et-Marne, by De Sénarmont; and of the Marne by Sauvage and Buvignier.

In 1853, of the Côte-d'Or, by Guillebot de Nerville.

In 1855, of the Meurthe, by Levallois.

In 1857, of the Loire, by Gruner; of the Dauphiné, by Lory; and of the Eure, by Passy.

In 1858, of the Yonne, by Leymerie and Raulin.

In 1859, of the Charente, by Coquand.

In 1860, of the Nord by Meugy.

In 1861, of the Haute-Marne, by De Chancourtois and Duhamel.

In 1862, of the Nièvre, by Ebray; and of the Vaucluse, by S. Gras.

In 1863, of the Doubs, by Résal and Royer; of the Isère, by S. Gras; and of the Puy-de-Dôme, by Lecocq.

In 1865, of the Seine, by Delesse; and of the Haute-Marne, by Royer and Barotte.

In 1867, of the Haut-Rhin, by Delbos and Koechlin.

In 1868, of the Ile-et-Vilaine, by Massieux; and of the Moselle, by Terquem and Barre.

In 1870, of the Ariège, by De Mussy.

In 1872, of the Aveyron, by Boisse.

In 1873, of Savoy, by Pillet, Lory, and Vallet.

Besides these, one or two geological maps of natural districts have been published, as for instance, of the Morvan, by Manés in 1863, and of the Briançonnais (the country around Briançon) by Lory in the same year. When the geological survey of Great Britain and Ireland had begun its long series of publications with maps on the scale of one inch to a mile (1 : 63,360), the small scale of the six-sheet map of 1841 was felt to be quite inadequate, and this feeling increased when it was seen that the English scheme included maps of special districts on a scale of 6 inches to a mile (1 : 10,560), and when the scales adopted by adjoining states were considered. Thus the Swiss geological map is drawn to a scale of 1 : 100,000, with parts enlarged to 1 : 25,000; that of Austria is to the scale of 1 : 144,000, and a new issue is about to be brought out on a larger scale (1 : 75,000); several of the German states are mapped geologically on scales of from 1 : 80,000 * to 1 : 50,000† and even 1 : 25,000.‡ In 1868, therefore, a new French Geological Survey was formed under the directorship of M. Elie de Beaumont, the staff consisting of course only of engineers belonging to the Government corps of mines. The map was to be drawn on a scale of 1 : 80,000, the size being decided by that of the Etat-Major, which could be conveniently adopted for the addition of the geological lines. The Franco-German war, however, stopped the progress of this map just as the Great Revolution stopped that of Lavoisier's Mineralogical map, and the death of the veteran chief Elie de Beaumont, which occurred last year, further interfered with the rapid carrying out of the scheme. Now, however, with M. Jacquart as Director, and M. de Lapparent as secretary to a council of eight eminent members, there is every prospect of the great enterprise being carried out successfully. The details of the system pursued will form the subject of a future paper.

G. A. LEBOUR,
F.G.S. Lond. & Belg., F.R.G.S., &c.

* Wesphalia, in 35 sheets, by v. d. Dechen, begun in 1856.
† Wurtemberg, Baden, Hesse-Darmstadt, &c.
‡ Prussia, new issue, with contour lines.

# Log Book.

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**Later News from Loanda.**—Up to the present time Lieut. Cameron has not been able to devise any means of sending back to their homes his fifty faithful followers, natives of Zanzibar. He had entered into negotiations with a view to obtain the services of some private vessel for this purpose, which, however, appear to have failed. The Council of the Royal Geographical Society have decided to ask the Admiralty if they would instruct the commander of the gunboat 'Spiteful,' through the commodore of the station, to afford such assistance in this matter as he might be able to give. As soon as he gets rid of his men Lieut. Cameron intends to come on to Madeira to enjoy the climate of the island, as at present he is not in a state of health to face the climate of England. After a couple of months' stay at Madeira, he hopes to reach England soon after Easter. A connection of Cameron's, Mr. Lovett, a well-known yachtsman, has already offered to place himself and his yacht at the traveller's disposal in order to bring him home from Madeira; but it was not at present known whether he would prefer to return by steamer or yacht. Cameron continues to send home instalments of his registered observations. A large sheet was received by the last mail, and it quite carried out the promise of his earlier instalment.

**Upper Nile.**—The Shilluks, between 9° and 12° N. latitude, in October last, rose in revolt and attacked the fortified Egyptian port of Fashoda. On the arrival of the steamer 'Ismailia,' Captain Gessi, the commandant Yusuf Bey marched against them, but fell into an ambuscade, and was killed with 142 of his men. Subsequently the Shilluks possessed themselves of Helet Kaka, where are the principal stores of Government and of the private merchants, and they also plundered some barges conveying Government stores. According to the latest information they are still beleaguering Fashoda to the number of 15,000 men. The new commandant, Aly Bey Kurdy, has made several sorties, but was repulsed in every instance.

Gordon is well, but all the Europeans who have joined him have returned north invalided. His steamer, it is said, ran aground (or was stopped by cataracts) on its way to the Albert Nyanza, and he is now prosecuting his explorations by land. The Nile above Dufile is said to bifurcate, and that branch which leads into the Albert Nyanza is stated not to be navigable.

**Shoa.**—The *Ausland* contains an interesting article on recent events in Shoa, from which we learn that a French embassy arrived there on the 17th of January, 1875, and was received in the most hospitable manner by King Menelek. The direct road between Tajurra and Shoa being closed, in consequence of the hostility between Danakil and Somal, the embassy travelled through Ausa and along the river Hawash, a route not previously described by European travellers. A threatened war between Shoa and King Johannes has been averted by a rising in the district of Sakelt, near Gondar, which was directed by Lej Ubie, a nephew of King Theodoros. This compelled Johannes to return from Yeju to the north, and he subsequently made a treaty, in which he accepted the Beshilo and Melli as the southern frontier of his kingdom, retaining, however, Magdala. The Galla prince of Woro Haimano,

in which Magdala is situated, and who had rebelled against Shoa, was, moreover, granted a sort of sovereignty over the Christian provinces of Wadela and Lasta. Under these circumstances, the peace can hardly be expected to be a lasting one.

**Chinchona Cultivation in India.**—On the Government plantations on the Nilgiri Hills there were, in 1875, 2,659,423 plants; the tallest tree being 30½ feet high, and 28½ inches in girth near the ground. As many as 290,447 plants and 503¼ ozs. of seeds have been distributed, and there are now many flourishing private plantations in Southern India. 28,659 lbs. of chinchona bark were shipped to England, from the Government plantations alone, for sale in the London market during 1875.

The chinchona plantations in British Sikkim and in Ceylon are equally flourishing. Mr. Wood, the able and indefatigable quinologist, expects soon to be in a position to manufacture 4000 lbs. yearly of an efficacious chinchona febrifuge, at a cost less than a rupee an ounce.

The trade in East Indian chinchona bark is rapidly increasing. In 1875 there were 879 bales, bags, and packages sold in the London market, containing about 87,000 lbs. of bark, and realizing about 14,000*l.*

**Italian Coral Fisheries, 1875.**—During April and May last 404 barks of 3925 tons, and manned by 3700 fishermen, left Torre del Greco, Leghorn, Santa Margherita, Ligure, Carloforte, Alghero, and Maddalena to carry on the coral fishery on the coasts of Africa, Sardinia, Sicily, Calabria, in the waters of Palinuro, Corsica, Ragusa, and the Gulf of Trieste. They fished up 110,436 kilogrammes of coral (of which 23,000 kilogrammes were of the first quality) of an estimated value of 186,445*l.*, leaving a net profit, after payment of all expenses, of 9705*l.*, or about 2*l.* 12*s.* a head. One bark was lost, 20 men died, and 48 deserted.

**Mr. Macleay in New Guinea.**—The 'Chevert' has returned to Sydney without the expectations of too ardent friends having been realized. A large collection of objects of natural history has been made, but no geographical discovery of importance. Mr. Macleay first visited the Katow River. The water was shoal for 12 miles from the land, and the navigation most intricate. The natives are described as "powerful and well made, jet black, with straight foreheads and Jewish noses, and without the projecting jaw of the Australian." They proved friendly. The country is a level swamp, fringed with mangroves, and densely covered with trees. The Katow at its mouth is 200 yards wide, but soon narrows to 60 yards. Mr. Macleay ascended the river for 8 miles. For the first 2 miles the banks were lined with mangroves, but beyond that with beautiful palms, rising to a height of 50 feet, and beyond them extended an interminable forest, with an occasional clearing, where there were plantations of taro and bananas. Mr. Macleay's further progress was stopped by a tree which had fallen across the river (there 30 yards wide), and which he failed to remove. He returned to Darnley Island, and in August sailed to Hall Sound, on the east side of the Gulf of Papua. The appearance of the country there is very different from what it was at the Katow. Dense mangrove swamps, intersected by salt creeks, extend for a few miles from the shore, and beyond that there are low ranges of well-wooded forests of gum-copal trees. At a distance of about 10 miles the country becomes apparently very rough, and in the distance rise gigantic mountains. The natives are a different race from those at the Katow. They are light coloured, and show a certain advance in civilization. At Yule Island Mr. Macleay met the Italian explorer D'Albertis. An attempt to ascend the Ethel River was frustrated, after having gone 10 or 12 miles, by fallen timber. The 'Chevert' reached Somerset on the 8th of September. Dr. James, with two other members of this expedition, is about to continue the exploration, taking Port Moresby for their base.

**The German Nautical Observatory** (Seewarte) at Hamburg has now become a German Government institution. So-called "normal" observatories will be established at Memel, Neufahrwasser, Swinemünde, Keitum (Syth), Borkum, Warnemünde, Kiel and Wilhelmshaven. These will communicate their observations daily by telegraph to the central observatory at Hamburg. Supplementary stations have been established on Heligoland, at Cuxhaven, Rügenwaldermünde and Pillau, which only communicate by telegraph in cases of importance. In addition to these there will be volunteer-stations at the coast as well as in the interior of the country, the expenses of which will be defrayed by private individuals or societies.

**The German Commercial Marine** consisted on the 1st of January, 1875, of 4303 sailing vessels (878,385 tons register, 33,085 men) and 299 steam-vessels (189,998 tons, 48,422 h.p., and 9339 men); total 4602 vessels, 1,068,383 tons and 42,424 men. The increase in the number of vessels, since 1871 has been 83, that of the tonnage 86,028.

**Commander F. J. Gray, R.N.**—We regret to have to announce the death of this promising surveying officer. Commander Gray, since he was sent to the East Coast of Africa, three years ago, in H.M.S. 'Nassau,' has completed a survey of upwards of a hundred miles northward of Zanzibar. In the end of November he landed to the northward of the port of Mozambique, and proceeded to fix the position of an important landmark, known as the Table Mountain. While on this service he was attacked by a fever from which he never recovered, and he died on board H.M.S. 'Nassau,' off Natal, on the 12th of Dec., 1875.

**Personalia.**—VON HEUGLIN has arrived at Cairo, in consequence of an invitation from the Khedive. He was to have accompanied the Egyptian force which has invaded Abyssinia, but according to our latest advices still remains at Cairo.

BARON VON RICHTHOFEN has been appointed Professor of Geography at the University of Bonn.

A MONUMENT to the late Dr. Livingstone, by Mrs. D. O. Hill, is about to be erected at Edinburgh, at the eastmost corner of Princes Street Gardens, one of the finest sites in the city. The committee still require 500*l.* before the statue can be completed. Subscriptions should be forwarded to Mr. T. H. Menzies, 4, St. Andrew Square, Edinburgh.

THE Parliament of New South Wales has voted 4000*l.* for a statue to be erected in the Hyde Park of Sydney, in memory of Captain Cook, the great navigator.

# Correspondence.

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## THE TAUGAS.

*To the Editor of the* "GEOGRAPHICAL MAGAZINE."

SIR,—The notices of China in early mediæval times are so scarce, and consequently so interesting, that it is a great temptation to extend them where we can. On the other hand it is our clear duty not to embarrass future students by erroneous deductions, and thus to intensify the difficulty of a study already sufficiently harassing. I wish to call attention to what I believe to be a serious error into which three of my most honoured teachers in Eastern ethnography—namely, Klaproth, Lassen, and Colonel Yule—have been led by their anxiety to clear up the question of the intercourse of China with the West in early times. Probably the longest notice of the further East contained in the Byzantine historians is the one often quoted from Theophylactus Simonocatta, and whose presence as an episode in that author's work is so curious and hard to explain. In this notice he has a reference to and description of a country called Taugas, which Klaproth, and the remaining authors who have written on the subject, have agreed is a synonym for China. I believe it to mean something very different, but before I give my reasons for doing so it will be more convenient to quote the whole passage. Theophylactus wrote about the year 610 A.D., and he reports how in 597 the Khakan of the Turks subdued the Avars. He says that, "A section of the latter escaped and found shelter among the Taugas, a celebrated colony of the Turks, distant 1500 stadia from India, who were very brave, very numerous, surpassing all the rest of the world. Another section, having lost their liberty, were content with a more humble position and joined the Mukrit, who were neighbours of the Taugas." A little further on he continues, "The Khakan of the Turks, having successfully terminated the civil war which had broken out in his country, made an alliance with the Taugas. The chief of this country called himself Taissan, which meant Son of God. This kingdom was never troubled by internal disorder, inasmuch as the succession to the throne was hereditary. They worshipped idols there, the laws were just, and the inhabitants peaceable. According to an old custom, which had the force of law, men might not wear gold ornaments, although there was much both of gold and silver among them, taken there by the active commerce which was carried on. Taugas was divided by a considerable river, which formerly separated two numerous races, of whom one wore black clothes and the other red. In our time," he adds, "and during the reign of Maurice, those who wore black clothes crossd the river to attack those who wore red ones, defeated them, and subdued their empire.

"The barbarians related that the city of Taugas was built by Alexander, after he had subdued the Sogdians and the Bactrians, and destroyed 120,000 barbarians by fire.

"The wives of the king, decked in gold and jewels, rode in gilt coaches, each one of which was drawn by an ox, richly decorated with a gold and jewelled bridle. The king had 700 concubines. The wives of the grandees used coaches which were silvered. It was said that Alexander built another town not many miles off (*i.e.* from Taugas) the barbarians called it Khubdan. After the king's death his wives shaved their heads and wore perpetual mourning; according to law they ought never to leave his tomb. Khubdan was divided by two wide rivers bordered by cypresses. It was said these Northern Indians were of a white complexion. Among them were found silkworms, which supplied a great quantity of silk of various colours. These barbarians were very clever in raising them and in using the silk they produced."

Klaproth says confidently Taugas is evidently China, which was united under one empire under the Sui dynasty, and the river which divided it was the Kiang which the Sui crossed in order to conquer the Chin, who had their court at Nanking, an event which occurred in 589; that is, exactly during the reign of Maurice, who reigned from 582-602. He identifies Taissan with the Chinese Thiantse, which means Son of God. Khubdan he identifies with Kumdan, the name by which the Turks and Syrians know Chang-ngan or Si-ngan-fu the capital of the Sui dynasty. The river Wei-chin flows north of this town, and there divides into two branches, which join one another after passing it. Although this commentary seems irresistible, and is most plausible in every way, I cannot admit its conclusiveness.

One portion of it may perhaps be reliable, namely, the identification of Khubdan with Kumdan or Si-ngan-fu, and the river Wei-chin with the two rivers of Theophylactus; but this does not involve the remainder of Klaproth's argument. We are specially told by the Byzantine author that Kumdan was 9 miles distant from Taugas, that it was not a part of Taugas. The problem that has to be solved, if we admit so much of Klaproth's argument, is to find a powerful kingdom in close neighbourhood to Si-ngan-fu, which shall answer the description of Theophylactus, and whose name shall be somewhat nearer akin to Taugas than China is. We fortunately have no difficulty in solving such a problem. Close to Si-ngan-fu, and bordering it on the north and north-west, was the great kingdom of the Uighur Turks, famous in Asiatic history for its cultivation of letters, of the arts, &c., &c. Now these Uighur Turks were known to the Arab geographers as Ta-gaz-gaz, a name which is assuredly no other than that of Taugas. Let me quote a short account of the Ta-gaz-gaz as given by the Arabs. They tell us their country was situated north of Tibet, and extended from the frontiers of Khorassan to those of China, that they formed the most powerful of all the Turkish tribes. Their chief, we are told, was styled Abar Khan (the reading of this name is uncertain, and Afez Khakan and Erkhan are given as variants), and he resided in the town of Kushan. He was called King of the Savage Beasts (*i.e.* Arslan Khan or Lion Khan, the name by which the Uighur chiefs of Kashgar were known) and the King of Horses, inasmuch as no king had so many powerful troops as he, none was more bloodthirsty, and none had a greater number of horses. Of all the Turks the Ta-gaz-gaz, according to Masudi, alone professed the religion of Manes (that is, were Buddhists) (See D'Ohsson's *Des Peuples du Caucasé*, p. 150). The last sentence of the above account is interesting. The Uighurs, who were undoubtedly the Ta-gaz-gaz of the Arabs, we know from other sources were Buddhists. Now the only Buddhists of Tibet and its borderland in early times, so far as we know, were Lamaists of the old or orthodox party, who were more or less replaced by the reforming Lamaists after the 14th century. The latter are known, from the colour of their costume, as the Yellow Lamas, while the old sect are known as the Red Lamas from wearing a red dress. This exactly corresponds with the account in Theophylactus, who tells us the Taugas worshipped idols (that is were Buddhists). He also tells us of a river which divided the country of Taugas, and divided also two peoples, those who wore red and those who wore black clothes, and he tells us that during the reign of Maurice the latter defeated and subdued the former. These people who wore red clothes were doubtless the red Lamaists among the Uighurs. Those who dressed in black were probably the Chinese subjects of the Sui dynasty.

We are told in the account of Theophylactus that while one nation of the Avars sought refuge among the Taugas, another escaped to their neighbours the Mukrit. These Mukrits are doubtless the Mekrit, Mekrin or Mukrit of Raschid ud din, Marco Polo, &c. Now the first of these authors describes two sections of the race, one of which lived in the neighbourhood of the Uighurs, and there it still remained in the time of the great

Timur, who names them among the inhabitants of the Eastern Thian Shan.

The above facts will suffice to make it nearly certain that by the Taugas of Theophylactus we must understand the Ta-gaz-gaz or Uighurs and not the Chinese, a distinct gain in unravelling the crooked history of the earlier Turks.—Yours, &c.,

HENRY H. HOWORTH.

DERBY HOUSE, ECCLES.

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## THE POSITION OF TEHRAN.

*To the Editor of the* "GEOGRAPHICAL MAGAZINE."

SIR,—In your November (1875) number I see an extract from a Russian scientific periodical, giving the position and altitude of Tehrán, as determined by Colonel Stebnitzki while employed there in observing the transit of Venus. The longitude is stated to have been obtained by means of the telegraph, the point of comparison being Eriván. Now, as Captain Pierson and I spent much time and trouble, in conjunction with Colonel Walker in London, and Captain Stiffe at Karáchi, in determining the longitude of the same place by direct time signals from London on the one side, and from India on the other, by signals repeated at Bushire, I was rather surprised to see Colonel Stebnitzki's determination given in your columns as something altogether new; but I was still more pleased at the opportunity of comparing the result of our labours with those of a subsequent observer. Unfortunately, the locality of the Indo-European Telegraph Office has been changed since our observations in 1871. Exact comparison is therefore impossible in the absence of a large scale map of the city. The topography being familiar to me, I am able, however, with the aid of a very small scale map (4 miles to the inch) to test roughly the agreement of the several positions. That of the old telegraph office in the Great Square is according to our 1871 observations—

| | |
|---|---|
| Latitude ... ... ... ... ... ... ... | 35° 40′ 30″ |
| Longitude ... ... ... ... ... ... ... | 57° 24′ 54″ |

Taking this position and my maps, I find those of the Russian Embassy and the building to which the telegraph office was transferred in 1872 to be as follows. Colonel Stebintzki's positions reduced from time to arc, being shown in the same table for immediate comparison :—

| | Russian Embassy. St. John and Pierson. | Stebnitzki. |
|---|---|---|
| Latitude ... ... ... | 35° 41′ 0″ | 35° 40′ 51″ |
| Longitude ... ... ... | 51° 25′ 42″ | 51° 25′ 9″ |

| | Telegraph Office. St. John and Pierson. | Stebnitzki. |
|---|---|---|
| Latitude ... ... ... | 35° 41′ 10″ | 35° 41′ 7″ |
| Longitude ... .. ... | 51° 25′ 10″ | 51° 25′ 48″ |

From this it would appear that while the latitudes agree as closely as could be expected from the small scale of the map, the longitudes are exactly inverted. I know that the telegraph office in 1872 was in a building some distance W. of the Russian Embassy. Colonel Stebnitzki places it half a mile E. If, as appears probable, your printer or the Russian has changed the two longitudes, our position and Colonel Stebnitzki's are in close accordance. If not, the telegraph office must have recently been shifted to a position a mile east, and in the same latitude as the building it occupied in 1871, and the longitude based on our 1871 observations be in excess of Colonel Stebnitzki's by about half a mile. This would be in near accordance with our time signals from India, which, taking the latest assumed position of Madras as a basis, placed the old telegraph office in longitude 51° 24′ 30″. On the other hand, Colonel Stebnitzki's assumption of Eriván as a base cannot pass unchallenged, without knowledge of the method by which the Caucasus survey was connected with European observations. I was unable to ascertain this while compiling a map of Persia, the Caspian marine surveys, the latest work published on the topography of those parts being referred to the meridians of Baku and Astrakhán. As Colonel Stebnitzki's transit calculations must be based on his longitude, it seems worth finding out where the error lies. For my part, I have written to Major Smith, Director of the Persian Telegraph, for a plan showing accurately the relative positions of the old and new telegraph offices and the Russian Embassies, and I hope that this letter may fall under the eye of a Russian reader in a position to clear up that side of the question. The altitude of Tehrán is given at 3740 feet or 3663 feet, the points of comparison being Eriván and Bakú. A long series of observations, with boiling thermometers, led me to place Tehrán at 3810 feet. Khanikoff says 3800, and his point of comparison was, if I remember rightly, Ashuradeh. I am inclined to prefer his altitude to that of his compatriot.

O. ST. JOHN.

MAYO COLLEGE, AJMERE, *December 7th*, 1875.

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## FRENCH AND GERMAN EXPEDITIONS TO THE OGOWE.

*To the Editor of the* "GEOGRAPHICAL MAGAZINE."

SIR,—The following information, just received, concerning the French and German Expeditions to the Ogowé, may not prove uninteresting to your readers.

My former assistant, Mr. Sinclair, writes me from the Ogowé on October the 5th, 1875, as follows :—"I am sorry to inform you that Dr. Lenz is making but slow progress—up to this he has not got farther than Lopé, He has been there since last I wrote you. The Oshébas will not let him pass: they are determined to be revenged for the treatment they received from the French gentlemen. Ranoki and his people have returned, also two Gorée men. When the Doctor left he depended solely on the Gorées to accompany him through. I hear through Ranoki, that if the Doctor cannot proceed inland he will go through the Ashira country on to Camma; perhaps this is only a report. I have not heard direct from the Doctor since he left; but if he remains there much longer without his goods being renewed, he will be compelled to return. The Gorées say that he has not anything to eat; all his tea, coffee, sugar, biscuits, flour, &c., being exhausted."

My friend, the Rev. Dr. Nassau, of the American Mission, writes from Adánlinanlângá on November 1st, 1875, to the following effect :—

"Dr Lenz, of the German Expedition, has not succeeded. I have not heard of his passing Lopé, and I hear that he has expended everything, and has not even the means—even a canoe—to bring him down again. M. Marche (your former acquaintance) is here on the 'Pioneer,' the forerunner of a French Expedition under Lieut. Brazza of the French Navy, who is in Gaboon with two white assistants (a doctor and scientist) and 70 soldiers, and who will be brought this far on his way in the 'Marabout.' He will be deputy commandant, with power to settle trade palavers in this river. He proposes to force his way to the Albert Nyanza. I envy him. It has been a dream of my own (though I do not believe in the forcing). . . . . This Ogowé certainly comes from very far. I think it is the outlet (perhaps the Benito is another) of Livingstone's 'nameless' lake, or the suspected lake in the Nyam-nyam country. One of Mr. Sinclair's Benga employés told me of a slave he had seen who said his country was Arĕga. Is not that Aléga—Maléga—Malegga—marked on the late maps northwest of Tanganyika? The slave said that in that country was a great sea (lake?) on which sailed ships with white men (Arabs with their dhows?) who traded

with the natives; that the natives placed on the beach their piles of food, &c., for sale, and then, in fear, hid themselves in the adjacent bush, and the 'white men' came ashore, laid down their pay for the food, &c., and went away; that the source of a river Wolo (Lolo? the Balèngi name for the Kombe Eyo—Benito) which turned away toward the north, was near the source of the Ogowé. I have long known that, wherever the source of the Benito was, it came from *behind* the Muni and the Gaboon."

The foregoing shows that shooting natives is a bad way of carrying on the exploration of such a country as Equatorial Africa, and it is much to be feared that the slaying of some of the Osyéba by MM. De Compiègne and Marche, will add to the difficulties, already great, in the way of Monsieur de Brazza and his party, if it does not entirely frustrate all attempts to penetrate by way of the Ogowé to the eastward, for many years to come.

Trusting that you will be able to find space for the above in your next number, I am, Sir, yours, &c.,

R. B. N. WALKER, F.R.G.S.

STOCKWELL, *Dec. 27th*, 1875.

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## NEW ILLUSTRATIONS OF "MARCO POLO."

*To the Editor of the* "GEOGRAPHICAL MAGAZINE."

SIR,—I can hardly expect *Marco Polo* to come to a third edition, or at least not for many a day. I should therefore be glad to record in the *Geographical Magazine* any new illustrations of special interest that reach me. For two such I am now indebted to Mr. R. B. Shaw. They are contained in a very interesting letter of his, written at Lahore, December 1st, 1875, after his last return from Kashgaria:—

(1) "I have heard stories related regarding a Buddhist high-priest whose temple is said to be not far to the east of Lanchu [on the Hwang-Ho, about long. 104° E.], which remind me of Marco Polo and Kublaï Khan. This high-priest is said to have the magic power of attracting cups and plates to him from a distance, so that they fly through the air into his hands [see *Marco Polo*, second edition, vol. i., p. 306].

(2) "Apropos of magic, a Manchu, long resident at Ila, described to me, amongst other feats of conjuring which he had seen, the rope trick, by which a man and boy are said to ascend out of sight towards the sky, from whence the severed limbs of the boy are afterwards thrown down. The man was himself a conjuror of some reputation, but did not pretend to be able to perform this trick. But it would seem the tradition of it remains in those regions" [see notes to *Marco Polo*, i., p. 308].—Yours, &c.,

*January 15th*, 1876. H. YULE.

## ORGANIZATION OF AN INDIAN METEOROLOGICAL DEPARTMENT.

THE scheme drawn up by Mr. Blanford for the organization of an Indian Meteorological Department, has been sanctioned in its entirety. A new first-class observatory will be established at Calcutta, instead of the present observatory at the Surveyor-General's office; the observatories at Madras and Bombay will remain independent under their present superintendents, and those at Allahabad and Lahore will be raised to first-class observatories. At the second-class observatories, twenty-one in number, hourly observations will be recorded on certain days only, and two sets of observations on other days. The remaining stations, seventy in all, will be third-class observatories, at which only two sets of observations will be recorded daily. Mr. H. F. Blanford is to be Reporter-General for India, and he will undertake the final discussion of all registers. It is thus a matter of congratulation that a real approach has now been made towards gaining a comprehensive view of the complex subject of Indian meteorology.

# Proceedings of Geographical Societies.

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## ROYAL GEOGRAPHICAL SOCIETY.

*Meeting of December 13th*, 1875.

THE PRESIDENT, SIR HENRY RAWLINSON, took the chair at 8.30 P.M.

The paper of the evening was by MR. OCTAVIUS STONE

### ON THE DISCOVERY OF THE MAI-KASSA OR BAXTER RIVER IN NEW GUINEA.

Some vague reports respecting a navigable river near Boigu having reached Cape York, it was decided upon by the Rev. S. M'Farlane, the head of the New Guinea Mission, to ascertain its truth. The expedition left Somerset, Cape York, on the 25th of August, in the mission steamer 'Ellengowan,' having the Rev. S. M'Farlane and Mr. Octavius Stone on board, and reached Boigu on the 30th of the same month. The mouth of the river was found to be in long. 142° 18′ E., and lat. 9° 8′ S., to the N. by W. of Boigu, the approach to it being rendered difficult by numerous sand-banks. The mouth of the river was found to be 2 miles in width, and 10 fathoms deep. Near its mouth the banks were firm, and the trees attained a height of 50 or 60 feet, with tall, straight trunks, from 5 to 10 inches in diameter. They met there with some natives from Boigu, who supplied them with coco-nuts and yams. They were perfectly naked; a pearl-shell, cut in the shape of a quarter moon, being suspended from their necks, falling over a portion of the breast, while their ears were pierced all round, and the lobes artificially elongated, and their hair cut so as to hang down nearly to the shoulders. Some wore wigs like mops, their heads being first shaved with a piece of glass or shell. They spoke of an immense bird which they said is found up the river, and "which can lift up a dugong and turn over a turtle." The Boigu, Saibai, and Dauan people are one and the same tribe, who speak a language very much like that spoken in the Straits, except that of Erub, Murray, and Stephens, which is perfectly different. By nature they are bloodthirsty, and frequently make raids into Koi-lago (the Big Land), as they call New Guinea, returning with the heads and jaw-bones of their slaughtered enemies. That part of New Guinea visible here from the sea stretches in a low line of mangrove trees as far as the eye can reach, and no raised ground of any description is in sight.

On the 1st of September the expedition entered the mouth of the Mai-kassa, called the Baxter River in honour of the donor of the 'Ellengowan,' and during the whole course of the subsequent journey, although it extended over 91 miles, only one native in a canoe was seen, though smoke arose occasionally. Having passed through a mangrove swamp, the river being about half a mile wide, the first coco trees were observed 10 miles up, and immediately afterwards a part was reached where the shore is composed of pipe-clay, rising perpendicularly 6 feet above the water, and extending 8 feet beneath it. The soil, 100 yards inland, was of a rich vegetable nature, while that close to the river was dry and clayey. Amongst the trees mangroves were predominant. At 25 miles the river bent to the west, continuing in that direction for the next 20 miles, through low and swampy country. Numerous streams, some of them of considerable width, enter on either side. At the 40th mile the only native encountered during the whole of their journey was met with. He was paddling a canoe, but made off as soon as he sighted the steamer. At the 45th mile the junction of a rapid river was reached. The current here ran at the rate of 4 miles an hour.

Early on the 3rd the men went ashore to cut wood, and an opportunity was thus afforded to examine the bank of the river. The ground rose to 30 feet, and was thickly carpeted with a long coarse grass. For the most part it was rich alluvial soil, but about a mile inland it was boggy. Red and yellow clay and ironstone (?) were plentiful near the river. The traces of wild boars were noticed, and evidences of the presence of natives. At the 50th mile the first native hut was seen, but no inhabitants. The river now turned to the north, its banks becoming higher, and the interminable mangroves were backed by forest trees 70 or 80 feet high. The stillness of all around was striking, and scarcely anything but a dozen birds were noticed throughout an entire day. At the 64th mile the river split in two, the branch from the north-east being the most considerable. The water here is still strongly brackish and the tide rises 6 feet. Bamboos grew abundantly, but no more coco-trees or other useful fruit or vegetable. There were signs of natives, for in Wood Bay, where the steamer had cast anchor, the remains of a kangaroo were found in a shelter constructed of the bark of the gum-tree.

On the 4th of September, Mr. M'Farlane, Mr. Stone and Captain Runcie proceeded up the north-western branch in the lifeboat. It narrowed rapidly, and took many sharp windings. At the 8th mile from the junction Wide Bay was passed, and at the 16th the water had become perfectly drinkable. The banks were high, and fertile land capable of cultivation extended far inland; and a native enclosure, cultivated with yams, sugar-cane and tobacco was actually discovered in a clearing of the forest. At Cascade Point, 82 miles from the mouth, a stream of sparkling water rushes down on the left. The Mai-kassa here is only 20 yards wide, and 2½ fathoms deep. On the 6th, Mr. Stone returned to this spot, and continued up the river. Birds became numerous, and a large one, estimated to have measured 14 to 16 feet across the wings, was seen flying high in the air. At the 91st mile the river had become very narrow, the leaves of the palm-trees meeting in the centre, and forming a natural arch. At the furthest point reached the river was 10 yards wide, and 2 fathoms deep, the tide rising 3 to 4 feet, though the water is perfectly fresh. Birds of paradise were plentiful, and three were shot. A boa-constrictor was likewise shot, and the foot-prints of some large animal, "such as a bull would make" were seen, though the natives of Boigu say there are no such animals. The trees there are 100 feet high and 4 feet across the trunk, which is perfectly erect and void of lower branches. Having placed the likeness of Her Majesty within a suitable niche, cut out of the trunk of a tree, the 'Ellengowan,' on the 7th of September, steamed full speed down the river, reaching its mouth in 8 hours 55 minutes, and on the 12th she was back at Somerset. Mr. Stone thinks that this exploration proves that the southern part of New Guinea is either cut up into a series of islands, or intersected by rivers of considerable length, which could easily be explored with a steam-launch drawing 3 feet of water.

In the discussion which followed the reading of the paper Mr. MULLENS remarked that the London Missionary Society had now been working at the head of the Papuan Gulf for nearly four years. Until the year 1870 the coasts of New Guinea were neglected, both by the English navy and the commercial world. Ships belonging to the navy had previously surveyed certain parts of the coast, some of the islands, and the reefs in Torres Straits, and the information thus obtained had been of the greatest use in the navigation of those Straits; but of the interior of the country scarcely anything was known until about five years ago. Four years ago, however, Mr. Murray, a South Sea missionary, and Mr. M'Farlane secured a very pleasant settlement for several native missionaries on the two islands of Tauan and Saibai. They entered into relations with the people there, and found that they were closely connected with the tribes on the mainland up one of the rivers, which they called the Katau River. The missionaries proceeded there in their boats, and visited the village of Katau, and were greatly amazed at the houses in which the Papuans were accustomed to live, the modes of dressing their hair, and other things to which Mr. Stone had referred. Their dealings were of a very friendly nature with the people of that and a neighbouring village, Torotoram. That was the beginning of their intercourse with the inhabitants of the mainland, and since that time separate stations had been established on no less than ten islands in the Papuan Gulf, immediately off the mainland.

The mission had been carried on with the help of the 'Ellengowan'; and Mr. M'Farlane's suggestion that the river which they had discovered should be called the Baxter River, in honour of the lady who had provided them with the steamer, was a very good one, notwithstanding the fact that the river had already a native name, the Mai-kassa. The immediate cause of the expedition, which Mr. Stone had described, was that Mr M'Farlane had endeavoured to extend the mission from the two islands of Tauan and Saibai, and the village of Katau towards the west; about 16 miles to the westward was the island of Boigu. After making due preparation, Mr. M'Farlane took some of his most experienced men to form a settlement there. They received a most hearty welcome from the people of Boigu, and were informed of the mouth of a river coming down to the coast of the mainland, at a distance of 4 miles from the north coast of the island. Before leaving he gave orders to the teachers to find out what they could of the river; and on his return found that they had crossed and proceeded 14 miles up the river. They informed him that they had seen dugongs playing in the water and begged him to bring over the steamer, because the river was quite large enough to admit it. Mr M'Farlane became greatly interested in the matter. He found Mr. Stone at Cape York, who was very anxious to accompany him, which was easily arranged.

Mr. Mullens then read extracts from letters of Mr. M'Farlane respecting the Boigu people, and the ascent of the Mai-kassa. He then proceeded to remark that previously to Mr. M'Farlane's visit no one had penetrated the interior of New Guinea in this part, though the Fly River had been visited and ascended for about 15 miles. Those who had gone up it at all had seen many natives, and met with a cordial hospitality from them. All along the coast of New Guinea there was an immense amount of swamp and mangrove. Many of the islands were not formed of ordinary clay soil or common earth; some of them immediately opposite the coast were very rocky; others were mere sandbanks. From the immense extent of coral reefs spreading in all directions all over the gulf, it appeared to him that the land had been settled for a very long period, and the coral insects had been allowed to work in an almost uninterrupted fashion for a great length of time. The coast of New Guinea itself was flat. There was only one hill between the mouth of the Katua River and the mouth of the Baxter. All the rivers had bars, their mouths being blocked up by the silt that was continually washed down, and could not get away because of the swirling tides. All this, of course, made the place exceedingly unhealthy. It was clear from Mr. Stone's account that the Baxter River was not a part of the Fly. It had been supposed that many of the rivers would turn out to be simply portions of the Fly; but the Baxter had evidently an independent origin in some of the fountains near the highest spot reached by Mr. Stone. The river there had narrowed to 10 yards wide and 2 fathoms deep, and he was of opinion that they were then near some very high land, clay banks, or otherwise, from which the river took its rise. He did not think that it extended another 100 miles inland, because at the point which the explorers reached the stream was so small.

Captain EVANS, Hydrographer to the Admiralty, said he had spent the greater part of three years in the neigh-

bourhood of New Guinea, and had visited the Fly River. In the surveying ship that he was engaged in (H.M.S. 'Fly'), they commenced a little to the east of Baxter River, and traced the land for nearly 100 miles round the head of the Gulf of Papua. In this extent of coast there were numerous arms, 4, 3, or 2 miles wide. Off the Fly River the water was fresh 10 miles from the mouth at low water. An attempt was made to ascend the Fly River, but the natives were so numerous and hostile that they were forced to retreat. His expedition spent a considerable time near the Katua River. Finding that the sea was very heavy, they decided upon waiting in Torres Straits until the weather abated; but as there seemed to be no likelihood of improvement they proceeded to Yule Island, and with the naturalists there explored the country in a small way. All who had visited that particular part of New Guinea—from which alone the interior could probably be reached—must have been impressed by the large population residing on the banks of the rivers; the Baxter River, in comparison, appeared to be scarcely more than a desert.

Mr. NICHOLLS said he had sailed along the coast to the westward of the Island of Boigu, nearly to 140° E. He had landed in New Guinea in 9° 15′ 30″ S. lat., and 141° 9′ 20″ E. long., upon a sand-pit. After following its course for about 2½ miles, he found that it ended in a raised plateau, which was densely wooded, many of the trees resembling the cabbage-palm of Australia. There was a village there, the natives of which received him in a friendly way, and gave him plenty of provisions—cocoa-nuts and yams. Mr. Stone supposed that the absence of cultivation accounted for the liking of the people for human flesh; but it was the practice of the Papuan race to cultivate the land; and in some places fences, similar to that described by Mr. Stone, were built to keep the wild pigs and other animals from destroying the young crops. He (Mr. Nicholls) had seen these fences in nearly all the islands of the South Sea which he had visited.

The PRESIDENT, in conclusion, on behalf of the Meeting, thanked Mr. Stone for the interesting letter they had received from him, and also Mr. Mullens for his lucid statement, wishing all possible success to the Society which he represented, and which had been the pioneer of discovery on the southern coast. So far as the authority of the Society extended, the name of Baxter River would willingly be adopted in commemoration of the noble-minded liberality of Miss Baxter of Dundee.

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*Meeting of January 10th, 1876.*

### CAMERON'S JOURNEY ACROSS AFRICA.

SIR HENRY RAWLINSON, the President, in opening the proceedings, said it was his pleasing duty to congratulate the Fellows of the Society upon the result of one of the most arduous and successful journeys which had ever been performed into the interior of the African continent. It was a further source of congratulation that this geographical feat had been performed by an Englishman, by one with whom the Society were well acquainted, and who had been acting under the auspices of the Royal Geographical Society. He need hardly explain that he alluded to the wonderful journey just accomplished by Lieutenant Cameron across the entire breadth of the African continent. They would remember that Lieutenant Cameron proceeded, in the first instance, to Africa on behalf of the Livingstone Search and Relief Expedition, that after Dr. Livingstone's death he undertook an exploration on his own account, under the auspices of the Society, and that they had all had occasion to commemorate his first important discovery, that of an outlet from Lake Tanganyika flowing apparently to the great Lualaba of Livingstone. They would further remember that the last announcement made with regard to Lieutenant Cameron was that he had left Ujiji March, 1874, with a view to trace down the outlet from Tanganyika to Lualaba, and pursue the course of the latter, supposing it to be the Congo, as far as the West Coast of Africa. In the anniversary address, delivered last May, he (the President) said there was no concealing the fact that the journey so contemplated was one of extreme danger, and that if Lieutenant Cameron succeeded he would have achieved a feat unparalleled in geographical discovery, and that he would take a place in the first rank of African explorers. It was true that he had not carried out the feat in its entirety; he had not followed up the Lualaba to the mouth of the Congo, but he had fairly traversed the continent from the east to the west coast, and in so doing had travelled 1200 miles of entirely new country, and further, by a course of most extensive and elaborate observations, had laid down for the first time a sound geographical basis for further exploration. That one fact would enable them to appreciate the extent and value of Lieutenant Cameron's labours and observations. Up to the present time they had been dependent for their knowledge of the geographical *status*, so to speak, of Central Africa upon one single lunar observation taken on Lake Tanganyika. Lieutenant Cameron had registered nearly 400 observations, verifying some of them by no fewer than 160 observations at one spot. He did not propose to follow Lieutenant Cameron's footsteps. The statement would come with more effect from his own letters. He would only mention the amount of materials they had received from the explorer at present and what they might expect to receive from him in the future, Lieutenant Cameron had addressed to the President and Secretary of the Society two letters, which would be read, and he had further sent an important instalment of his maps and observations.

The letters referred to were then read. They were written from Sha Kelembe, on the river Lumeji, in lat. 11° 31′ S., long. 20° 24′ E., from Chikumbio village near Peho, in Kebokwe, and from Loanda, and dated 7th of September, 17th of September, and 22nd of November respectively. Their substance is given in the leading article of our present number.

The President then read some notes prepared by Mr. Keith Johnston, which referred to the bearing of Cameron's discoveries upon those made by his predecessors. No doubt could now be entertained as to the identity of the Congo with the Lualaba, and the President considered that question settled, so far as any question could be regarded as settled, as to which they had not before them absolute and positive demonstration.

In conclusion, a discussion followed, in the course of which the results of Cameron's explorations received general and warm recognition.

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### PARIS GEOGRAPHICAL SOCIETY.

*December 15th*, 1875.—M. Delesse in the chair. The President stated that the following had been elected honorary members of the Society, viz., General Baeyer, Dr. F. V. Hayden, Dr. von Hochstetter, General A. A. Humphreys, Dr. J. Hunfalvy, Colonel T. G. Montgomerie, Sir Henry Rawlinson, M. Kuelens, M. P. de Semenof, M. N. Severtzof. Dr. O. Torell, Colonel W. F. Versteeg, and M. Vorsua.

Mr. William Martin proposed that a portion of the *Bulletin* be reserved for answers to correspondents, who may be desirous of obtaining information on particular subjects connected with geographical studies.

The Abbé Berthon, a missionary stationed in the Chinese province of Kouy-tcheu, offers his services to the Society as an explorer, and begs that some surveying instruments be forwarded to him. He describes Kouy-tcheu as the smallest and poorest of the eighteen provinces of China, but as affording a rich field to the naturalist and explorer.

Monsgn. Chauveau, vicar apostolic of Tibet, writes from Ta-tsien-lu, on the 24th of September, that he has forwarded to the Society a case containing several Tibetan products. Amongst these are four sticks of lac, called tse-kiao in Chinese and la-guia in Tibetan, which is used for sealing letters; two packets of Tibetan incense (tsang-hiang in Chinese, ha-sa-pu in Tibetan), which he considers will destroy the flies infesting rooms; and a few pieces of "coral" (shan-fu in Chinese, kiy-le in Tibetan), which the Tibetans pretend to find in a large lake to the north-west of L'hasa.

M. Vacquez-Lalo, in a letter addressed to the Society, complains about the condemnation of the orthographic projection, in an article of the *Bulletin* for November.

M. Meurand communicated to the Society a statistical account of the Australian colony, Victoria, which had been forwarded by the French Consul at Melbourne to the Foreign Office.

M. Levasseur delivered an address on the life of the late M. Jules Duval, formerly Chairmen of the Council of the Society.

*December 20th*, 1875.—Baron de la Roncière Le Noury in the chair. The meeting was crowded, and many ladies were present. M. Delesse announced that no less than 191 members had joined the Society since the 21st of April. M. Maunoir, the secretary, then read the usual report on the progress of geography in 1875. He first of all paid a tribute to the memory of the ordinary and corresponding members who had died during the year, and amongst whom d'Avezac, Winwood Reade, and General Dufour, were most widely known. The Society had increased from 1100 members, at the close of 1874, to 1400, and its revenue from 720*l.* to 2800*l.* No less than 1800 books and maps had been added to the library. M. Maunoir referred with satisfaction to the Geographical Congress and to the meeting of the International Geodetical Commission, which almost immediately succeeded it, and then spoke at some length of French geographical enterprise during the year. The expedition for observing the transit of Venus, under M. Janssen, and the government missions to St. Paul and Campbell Island were mentioned. The activity of the newly-established geographical societies at Lyons, Bordeaux, and Toulouse, and of the "Commission of Commercial Geography" at Paris, was favourably commented upon, and the French periodical *l'Explorateur* felicitated upon the manner in which it diffused a knowledge of geography. The speaker then noticed the principal exploratory expeditions which had been carried on or brought to a conclusion during the year. With reference to America, he dwelt at length upon the labours of Dr. Hayden and Lieut. Wheeler in the Rocky Mountains; of Petitot, in the basin of the Mackenzie; and of Commander Dewey on the coasts of California. He then noticed the Polar Expedition, conducted by Nordenskiöld, and that which recently left England for Smith Sound, and paid a high tribute to the scientific value of the work done by the 'Challenger' Expedition. John Forrest and Colonel Egerton-Warburton were mentioned in connection with Australia. The English and Russian explorations in Central Asia were referred to at length, and Colonel Montgomerie was congratulated upon the great services rendered by the native explorers whom he had trained. The labours of Nachtigal, Stanley, Lieut. Cameron, Brazza and Marche, and Captain Roudaire were referred to in connection with Africa.

Baron Reille then rendered an account of the Geographical Congress. There had been 316 patrons (*donateurs*) and 1300 ordinary subscribers, and nearly 500 foreign savants had attended. The receipts, including a subsidy of 1480*l.* granted by government and the City of Paris, 1600*l.* paid by patrons and subscribers, and 400*l.* voted by the Geographical Society, had proved amply sufficient to pay all expenses, and there remained about 800*l.* to defray the printing of the Report. The exhibition had been visited by nearly 150,000 persons, amongst whom were the Archduke Albert of Austria, the Grand Duke Constantine of Russia, and the Sultan of Zanzibar.

M. Ernest Desjardins delivered an address on Historical Geography, insisting upon its importance to the student of history. He admitted the great services which Germany had rendered to that branch of inquiry in recent times, but claimed the honour of having first cultivated it with success for Danville, who was the first to compile maps illustrating ancient history, and who must be looked upon as the creator of modern cartography. He was preceded only, as regards the middle ages, by Valois. Great efforts had been made to identify the sites of places, but he thought the time had arrived now, to reconstruct the geography and statistics of certain epochs. As far as ancient Gaul was concerned, much progress towards that goal had already been made, and we were now in a position to form a fair idea of the political, social, and religious aspects of that province whilst under the rule of the Romans.

In conclusion M. Charles Cotard discussed M. de Lesseps's scheme of a railway to British India.

The annual dinner of the Society took place on the 22nd of December, Baron de la Roncière Le Noury presiding. Toasts were proposed by the President, M. Delesse, M. Malte-Brun, M. Maunoir, M. Deloche, and M. Meurand.

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## PARIS COMMISSION OF COMMERCIAL GEOGRAPHY.

*December 23rd*, 1875.—M. Pinet in the chair. M. Hertz reported favourably on M. Biard's scheme of "instructive voyages" round the world, particularly with a view to the acquisition of commercial knowledge. M. Gros reported on M. Leon Boutard's proposal of establishing colonies of foundlings (*Enfants assistés*) in Algeria.

The present position of foundlings was described as deplorable in the extreme. The farmers, with whom they are placed, looked upon them as their legitimate prey; their education and morals were not attended to, and they supplied consequently numerous recruits to the criminal population. By establishing them in Algeria, a serious element of demoralization would not only be removed from France, but the colony would obtain settlers, who left their native country without regret, and would devote their energies to the development of the resources of their new home. He therefore proposed that the Commission should pass a resolution in favour of this scheme.

M. Bonnavoy de Prémot said that he himself had conceived a similar scheme some time ago, but that it was surrounded by difficulties, and ought therefore to be referred to a committee. M. Hertz suggested the nomination of two delegates, and this proposition was accepted after a long discussion, in the course of which M. Boutard stated that he considered the province of Constantine to be most favourable for the establishment of the first Foundling Settlement.

The various projects for constructing a canal between the Atlantic and Pacific were then discussed.

Count Meyners d'Estrée then reported on M. Brau de Saint-Pol-Lias's scheme of colonization, and the meeting passed a resolution in favour of it. The author proposes to establish "groups of exploring colonists" (*colons explorateurs*) in favoured localities, and has selected Sumatra for his first experiment. The "group" proposed would include an agriculturalist, an engineer, a surgeon, a merchant, two naturalists and a manager, and the task of the colonists would extend to the exploration of the country surrounding their settlement, and the discovery of localities suited for the establishment of other "groups" similarly constituted.

M. Hertz stated that M. Camus was now in communication with the French Government with reference to

the monopoly of the trade on the Assinie River, granted to him by the King of Ashanti, and it was resolved to solicit the Government to render M. Camus every assistance.

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## BERLIN GEOGRAPHICAL SOCIETY.

*December 4th*, 1875.—Baron Richthofen in the chair. The President announced that Lieut. Lux had been compelled by illness to relinquish his position on the West African Expedition, and that there remained now only Dr. P. Pogge to penetrate to the capital of the Muata Yanvo. No news had been received from Major Homeyer, whom the papers reported to be ill at Lisbon, nor from Dr. Lenz, who was prosecuting his labours on the Ogowé. He also announced that a German geologist of some reputation, Baron Barth, of Munich, had been engaged by the Portuguese Government to explore Angola. Dr. Koner, the secretary, reported on Stanley's expedition, and referred to the deaths of Count Zichy and Munzinger. Dr. G. W. Leitner then delivered an address on the tribes and languages of Dardistan, which was illustrated by several articles of curiosity and antiquity brought home by him.

*January 8th*, 1876.—Baron F. Richthofen in the chair. Amongst the works presented was a *facsimile* of one of Mercator's oldest maps of the world, published at the expense of the Belgian Government. Dr. H. Kiepert said that scarcely any of the earlier works of Mercator had been handed down to our time, and the only copy of his map of the world was now at Paris, whilst his globe, engraved in fourteen gores, appeared to have been lost to us for ever, when at a sale at Geneva, a copy of this precious work was fortunately discovered, and had now been reproduced in photo-lithography. Dr. R. Kiepert then spoke in terms of high praise with respect to the work performed by Cameron.

Letters were then read from Dr. Lenz, who is now exploring the Ogowé. After an arduous journey of 20 days he had reached Lope, in the Okanda country, but his subsequent attempt to penetrate the Osheba country had been frustrated by the natives, with whom the Marquis de Compiègne had had a fight in 1873, when several of them were killed, and who had threatened to take their revenge upon the first white man who should enter their country. Dr. Lenz's carriers having fled, he was obliged to return to Lope, and there he remains for the present.

Dr. Nachtigal, the President of the African Society, then reported on the present state of the expedition on the Loango and Angola coasts. As regarded the former, the difficulty of obtaining carriers had been overcome, and Drs. Pechuel-Loesche and Lindner would make another attempt to penetrate into the interior. Dr. Soyaux was still ill at Chinxoxo, and he and Dr. Falkenstein would return to Europe. Dr. Pogge, the only remaining member of Homeyer's Expedition, had perhaps already reached Kabebe, and was on the road to the Tanganyika.

Dr. G. Neumayer, the Director of the German Nautical Observatory, then read a paper "on the study of hydrography and maritime meteorology, and its influence upon kindred sciences." Hydrography originally confined itself to an exact survey of the coasts and to the compilation of so-called sailing directions, and it was the duty of every national navy, not only to survey the home shores but also those of more remote countries, which were visited for purposes of trade. In recent times hydrography had become a more comprehensive science by making it embrace what might aptly be called maritime meteorology. Careful observations made on board-ship were calculated to supply material for nearly every branch of natural science. He mentioned Dove and H. Berghaus, who had been amongst the first to recognise this, and spoke of the efforts made in that direction by Maury and others, in terms of high praise. In Germany the hydrographical work was being carried on now by three departments, viz., the Hydrographical Office, the Nautical Observatory at Hamburg, and the Commission for exploring the German Seas at Kiel.

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## VIENNA GEOGRAPHICAL SOCIETY.

*November 23rd*, 1875.—Dr. F. Von Hochstetter in the chair. The meeting was held in the large room of the Academy of Sciences. Dr. Nachtigal delivered an address on his journey through Africa, dwelling particularly upon the social and political condition of Wadai.

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## ITALIAN GEOGRAPHICAL SOCIETY.

*December 12th*, 1875.—Signor Maraini, Vice-President, in the chair. Captain Barattieri reported on the Italian Expedition to Tunis and the Gulf of Gabes, and directed the attention of the meeting particularly to Jerba Island, which was inhabited by 50,000 Berbers, and whose trade was carried on by Maltese, Italians, and Jews. The Rubatino Steamship Company was about to connect that island by a line of steamers with Sfax, Tunis, and Italy.

Signor Camperio then reported on Stanley's discoveries in the region of the Nile, and Signor Antinori rendered an account of the preparations which had been made for an Italian Expedition to Eastern Africa. He said that 2400*l.* had already been subscribed towards the expenses of the Expedition, and that they proposed to travel from Berbera to Shoa.

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## EGYPTIAN GEOGRAPHICAL SOCIETY.

*December 17th*, 1875.—The President, Dr. G. Schweinfurth, said that the Society now numbered 325 members, and that the Khedive had extended to it the franking privilege as far as Egypt was concerned. Many donations had been received for the library, and a number of valuable reports from the interior, including one from Colonel Gordon. The Marquis de Compiègne then rendered an account of his explorations on the Ogowé, which was illustrated by a map. Dor-Bey, Inspector-General of Schools, spoke on Munzinger's assassination, and the meeting rose in recognition of the services of that explorer and valuable government official. Mr. Junker, of Moscow, then gave a report of an excursion into the Libyan Desert, which he had undertaken preparatory to a journey into Dar Fur. The meeting-room of the Society which holds about 250 auditors, was crowded during this the second meeting of the Society.

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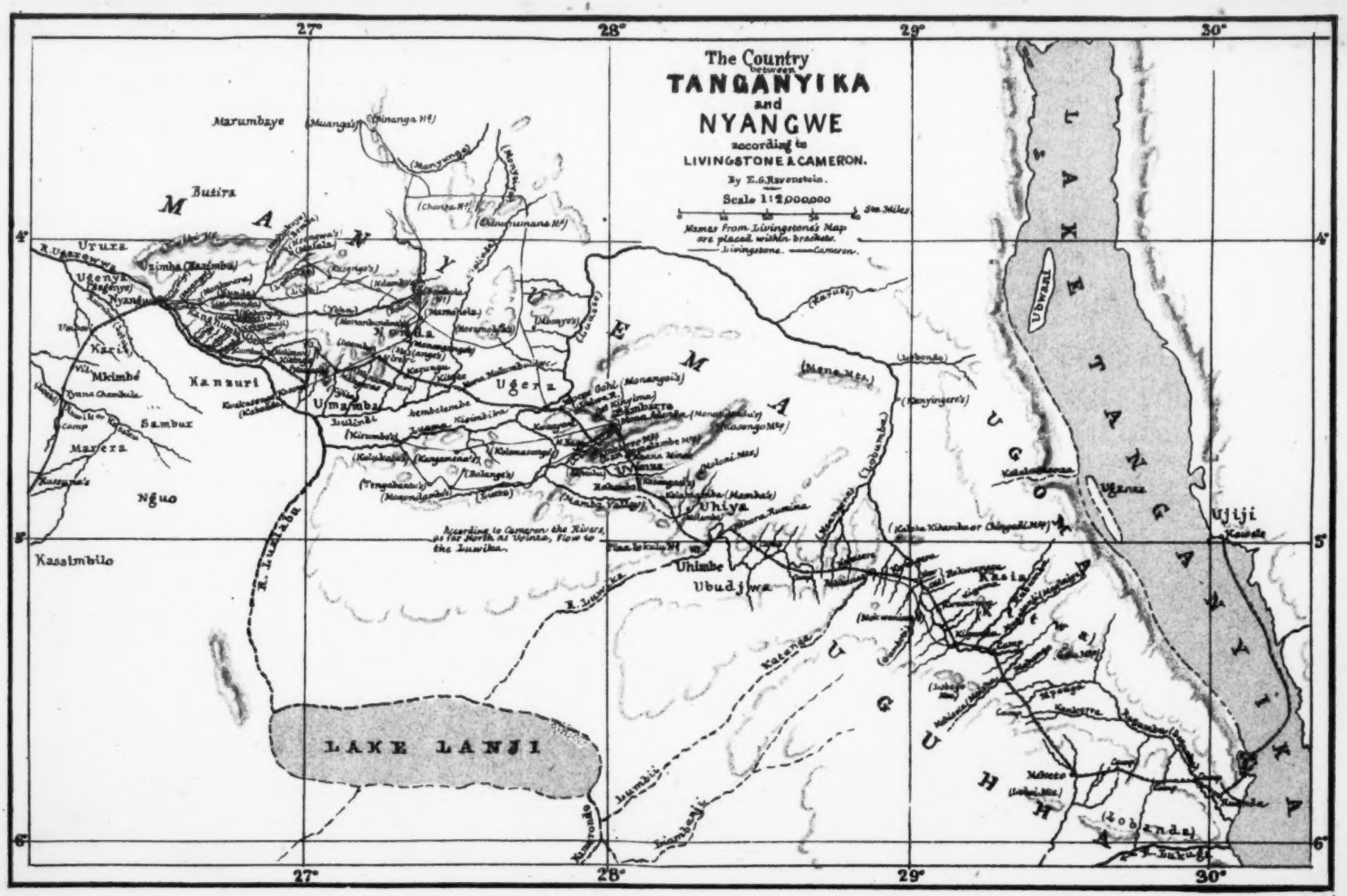
The Country
between
TANGANYIKA
and
NYANGWE
according to
LIVINGSTONE & CAMERON.
By E.G. Ravenstein.
Scale 1:2,000,000
Names from Livingstone's Map are placed within brackets.
Livingstone. Cameron.
27°
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Marumbaye
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Utura
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Ugenye
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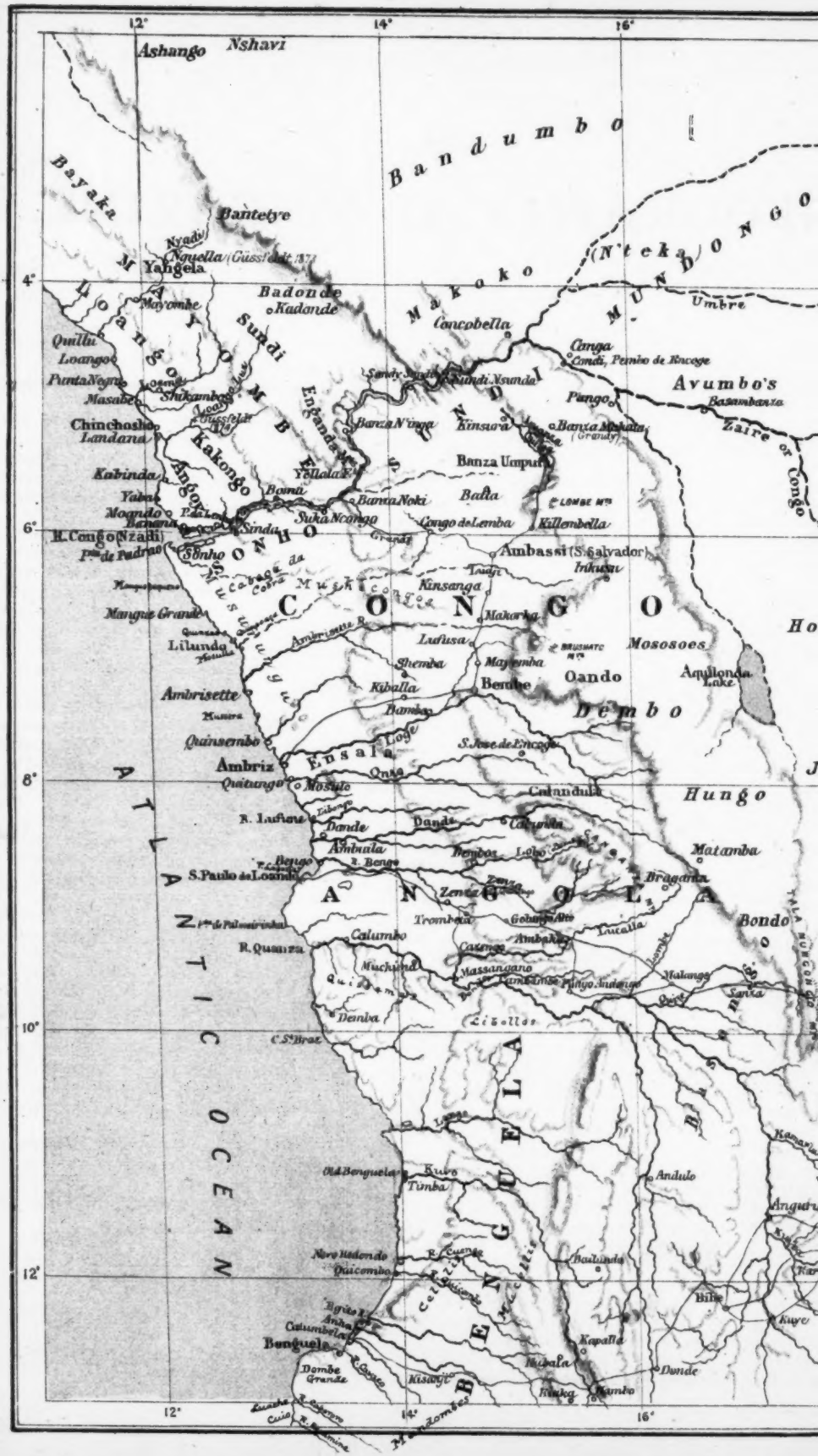
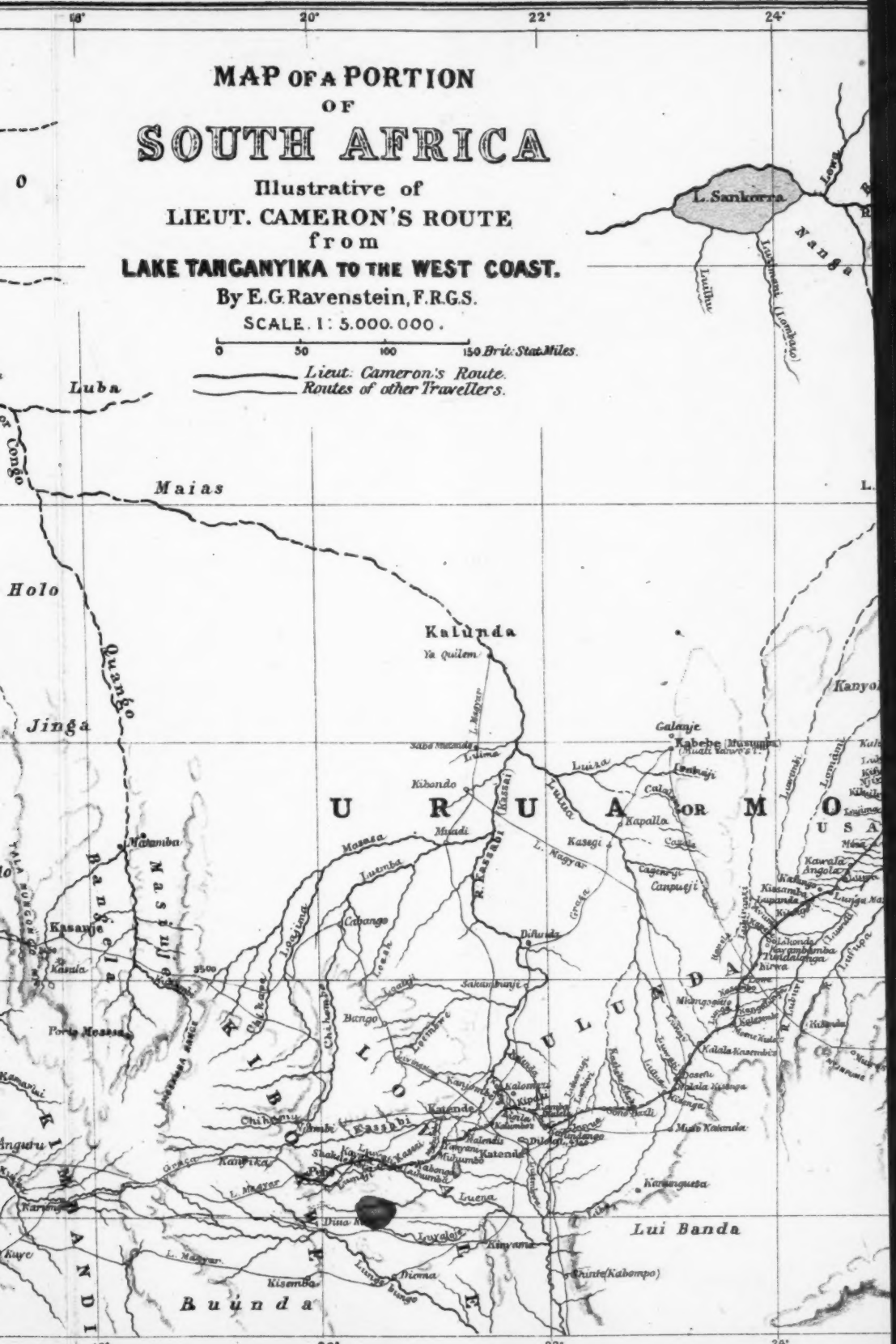
Kanzuri
Bambus
Manera
Nguo
Kassimbilo
R. Luvua
Umamba
Ugera
Uhiya
Uhimbe
Ubudjwa
LAKE LANJI
According to Cameron the Rivers as far North as Uhiya, Flow to the Luvua.
Kasia
Ujiji
Kawele
LAKE TANGANYIKA
Uvwai
UGOGO
UHHA
Mpweto
Zobanda
Lukugi
Kamondo
Lumbili
Lumbeshi
Katanda


Ashango
Nshavi
Bandumbo
Bayaka
Bantetye
Nyadi Nquella (Guss' edit. '87)
Yangela
Makoko
(N'teka)
MUNDONGO
Umbre
Badonde
Kadonde
Concobella
Quillu
Loango
Punta Negra
Masabe
Shikamba
LOANGO
Fiote
Fiote
Bundi
Enganda
Sandy
Bundi Nsunda
Canga
Cmdi, Pemba de Encoge
Avumbo's
Basambanza
Pango
Zaire or Congo
Chinchoxlio
Landana
Kakongo
Banza N'unga
Kinsuka
Banza Makuta (Grandy)
Kabinda
Yabe
Mogndo
Banana
Angoy
Boma
Yellala F.
Banza Umpuri
Banza Noki
Bulla
Lombe R.
Suka Ncongo
Congo de Lamba
Killembella
R. Congo (Nzadi)
Pta de Padrao
Sonho
Sindia
Grande
Ambassi (S. Salvador)
Ludge
Inkusu
Mucoboga da Cobra
Mucico
Kinsanga
CONGO
Mangue Grande
Makarka
Lilunda
Ambrizette
Luiusa
Shemba
Mayemba
Mososoes
Oando
Aquilonda Lake
Kiballa
Benibe
Bamba
Dembo
Quinsembo
Logu
S. Jose de Encoge
Ensala
Ambriz
Quitungo
Onzo
Mosulo
Calandula
Hungo
R. Luiiana
Dande
Calumba
Ambuila
R. Bengo
Bembos
Lobo
Matamba
S. Paulo de Loanda
Bengo
ANGOLA
Zenza
Bragança
Trombeta
Gelungo Alto
Lucalla
Bondo
Pta de Palmeirinha
Columbo
R. Quanza
Amba Nzo
Casenge
Muchimbi
Massangano
Pungo Andongo
Malongo
Santa
Quizama
Denba
Libollo
C. S. Braz
ATLANTIC OCEAN
BENGUELA
Old Benguela
Kuvo
Tumba
Andulo
Nova Redondo
Quicombo
R. Cuanza
Bailundo
Bihe
Kuye
Egito R.
Amba
Catumbela
Benguela
Kapalla
Kibala
Dombe Grande
Kisanjio
Rimbo
Mumbo
Donde
Cuisa
R. Longa
R. Kumina
Mon Combes
12°
14°
16°
4°
6°
8°
10°
12°


MAP OF A PORTION
OF
SOUTH AFRICA
Illustrative of
LIEUT. CAMERON'S ROUTE
from
LAKE TANGANYIKA TO THE WEST COAST.
By E.G. Ravenstein, F.R.G.S.
SCALE. 1: 5.000.000.
0 50 100 150 Brit: Stat: Miles.
Lieut. Cameron's Route.
Routes of other Travellers.
18° 20° 22° 24°
L. Sankorra
Luba
Maias
Holo
Kalunda
Ya Quilem
Jinga
Quango
Kabebe
Kapallo
Kasanje
Matamba
Bangella
Massanji
Kasanji
Kasabi
Kasai
Lulua
Muladi
Kasegi
Cabango
Difunda
Sakambunji
Bango
Chibokue
Chilemba
Chibokue
Kalonga
Katende
Kanyika
Kamalundi
Kamalundi
Kasabi
Kasabi
Kamalundi
Kamalundi
Kamalund

# MAP OF A PORTION OF OUTH AFRICA

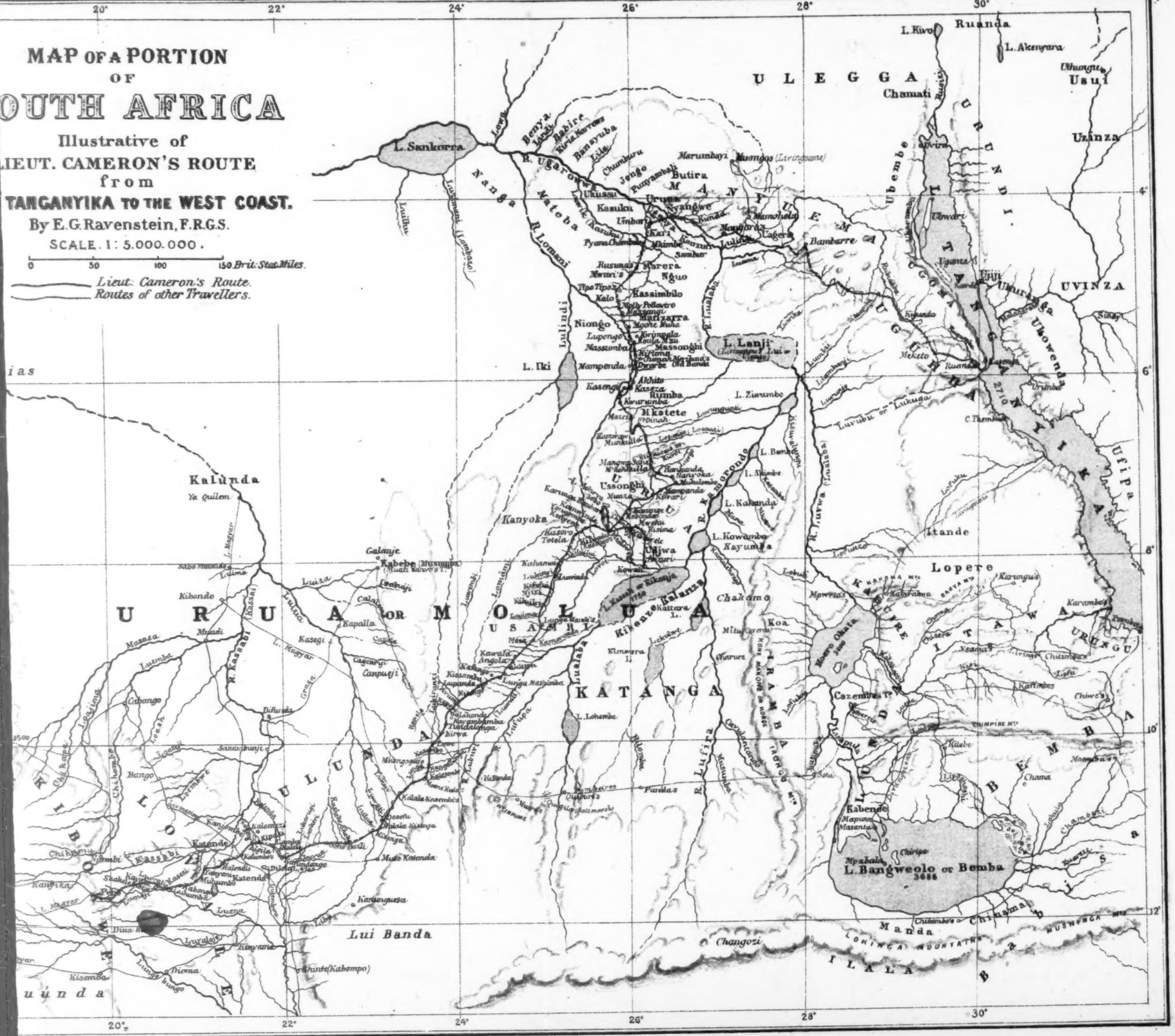
Illustrative of
IEUT. CAMERON'S ROUTE
from
TANGANYIKA TO THE WEST COAST.

By E. G. Ravenstein, F.R.G.S.

SCALE. 1: 5.000.000.

0 50 100 150 Brit. Stat. Miles.

Lieut. Cameron's Route.
Routes of other Travellers.


L. Kivu
Ruanda
L. Akenyaru
ULEGGA
Chamati
Usui
Uzinza
L. Sankurra
Nanga
R. Ugaroa
R. Lomani
Matoba
Butira
MANYUEMA
Bambarre
UVINZA
L. Lanji
Niongo
Lulindi
L. Iki
Kalunda
Kanyoka
Ussonghi
Kasongo
Kabebe (Musumba)
Kibondo
URUA
Kapallo
Cabango
Difunda
R. Kassabi
Kalonda
Katende
Kalomera
Kalenda
Mukumba
Karanguesa
Lui Banda
Chinte (Kabompo)
Kisemba
Diona
Luena
Dua
Kiyanga
Kikonja
Kassabi
Bango
Chikapa
Chikombe
Kalala Kasembe
Mato Kalanda
Kalala
Kasambunje
Mwanga
Kawala
Angola
Kasamba
Kaupanda
Kinkondja
Kalonda
Kayambamba
Kalalanga
Mirangombo
Kalenga
Kasenga
Kalunda
Kalumera
Kalumbi
Kipoko
Kalala
Lambo
Kalumera
Kalumbi
Kasenga
Kalenda
Mukumba
Kalonda
Kayambamba
Kalalanga
Kalenga
Kalunda
Kalala Kasembe
Mato Kalanda